Medical Times

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Shall a Fifth Year be Added to the Medical Curriculum?

The ever-increasing demand for a broader medical education influenced the MEDICAL TIMES to ask the deans of some of the larger American medical schools their opinion of the advisability of adding a fifth year to the medical curriculum and, if they were favorable, whether the extra year should be devoted to didactic or clinical work.

The response was generous and the subjoined contributions from representatives of many of the leading medical institutions in the country show a general feeling toward the necessity of higher educational requirements.

The belief has been expressed in some quarters that the additional demands upon the student, especially in requiring him to possess a degree in arts or sciences before entering upon the study of medicine, necessitate his entrance upon the serious part of his life at too advanced an age. There are two sides to this. President Harry Pratt Judson, of the University of Chicago, in discussing the necessity for readjusting preliminary and collegiate education in reference to medical study, at the recent Chicago conference on medical education, said:

"We are apt to take a student when he is young, and when his mind is not highly developed and turn him loose in the world as a practicing physician without the proper breadth of training a physician should have. On the other hand, we take him through the secondary school, the college and the medical school, make him an intern, and by the time he is ready to settle down he is pretty far advanced in life."

Everyone will admit that the average youth, just out of high school at the immature age of 17 to 18, is not mentally equipped to take up the serious work required by preparation for a medical degree.

He should have a broader foundation than that given in the preparatory school, so that his mind may be better trained to study, as well as that he may possess a wider general knowledge. The well equipped physician should know something more than the mere theories and technicalities of his profession.

In a discussion of this subject before the Society of Medical Jurisprudence at the New York Academy of Medicine on March 10, the Editor of the MEDICAL TIMES advocated the actual alliance of the medical school with a college or university so that the medical school shall be a department of the collegiate institution, and the establishment of a seven year course; two years of premedical work and five years of medicine, leading to the combined degrees of B. S. and M. D.

The premedical curriculum would include advanced physics, chemistry, biology, zoology, psychology, logic, history, French, German and possibly some elective courses. These subjects would give the student a splendid foundation upon which to erect his medical structure. Upon the successful completion of this work he could enter upon his five years' medical course, the last year of which should be spent in a hospital.

By following this line of study, the boy graduating from the high school at 18 would be ready to enter upon the practice of medicine at 25, not a bit too early for a young man to have the lives of human beings dependent upon his skill and judgment. We advocate the hospital year for *every* student, for the clinical knowledge which can only come with clinical observation in the wards is quite as essential for the laboratory worker, even if he never expects to enter the actual practice of his profession.

We feel that the fifth year should be made obligatory, despite the fact that 70 per cent. of the 956 men graduating from 70 of the better medical schools in 1912 obtained hospital internships. It is often the men who need clinical instruction most, who fail to obtain appointments or do not see the necessity of so doing.

The State of Pennsylvania has taken the lead in this matter by requiring the candidates who appear before its State Board of Medical Examiners on and after January 1, 1914, to have had one year of college credits and one year of hospital internship. Other state boards have similar requirements under consideration and a general action along these lines by state examiners would doubtless hasten an increase in requirements on the part of medical schools.

Medical education in the United States is in a process of evolution. Forty years ago and less the two-year course was in vogue and indeed a few of the weaker schools kept this short course until about 1896. Rightfully the two-year course gave way to three years and another year was added in from 1899 to 1902.

There were nearly 175 medical schools in the United States when the four-year curriculum was adopted, many of them unworthy of the name. The exigencies of medical teaching and the demands for better qualified medical men caused a curtailment in the number of schools, by consolidation, as well as from inanition. Now there are 117 and the scholastic year of 1913-14 will see about 100. Over a score of these are refused recognition by more than half of the state boards. There is room for about 50 medical teaching institutions in this country and more is a superfluity. It may be hard on the poor and deserving student to hedge medical education about with so many safeguards, but in this day when *efficiency* is the watchword, the best must be done for the greatest number. The study and practice of medicine must, like every other human activity, give way to the survival of the fittest.

That our medical education by and large is below the European standard is in the main admitted and our system of medical registration is archaic. In order that the methods in vogue across the seas may be compared with our own, we are presenting articles by graduates of European universities, which give the American physician a comprehensive idea of foreign requirements.

A SATISFACTORY FIFTH YEAR DEMANDS REVISION OF HOSPITAL FACILITIES.

GEORGE BLUMER, M. D.,
Dean of the Medical Faculty of Yale University,
New Haven, Conn.

In the discussion of the advisability of adding a fifth year to the curriculum of American medical colleges, I would point out that the five-year course of foreign schools is not strictly comparable to the proposed American five-year course, inasmuch as the five-year European course includes the preliminary training in chemistry, biology and physics. This training is required before entrance into the medical school by the best American schools.

It is quite apparent to the members of the faculty of American medical schools that the curriculum is at present overcrowded. It is questionable whether this overcrowding is not partly due to faulty methods, especially to overlapping and to improper pedagogics. There are some who are of the opinion that better correlation among the different departments in the medical school, and better methods of instruction, would result in a diminution of the present overcrowded condition of the curriculum; so that, however desirable a fifth year may be, a careful revision of the first four years should be a preliminary step.

In view of the American custom of requiring the basic sciences for entrance to the medical school, it would seem logical to add the fifth year to the clinical end rather than to the pre-clinical years. This step has already been taken in some States—notably Minnesota. This requirement, i. e., a fifth hospital year—would work very little hardship inasmuch as a large percentage of graduates, at any rate from the better schools, take a hospital training after graduation. In our experience, from seventy-five to ninety-five per cent. of the graduating class take hospital work.

If it should seem desirable to demand an obligatory fifth year, it seems to me it should have some elasticity. There is a small percentage of men in every class who wish to devote themselves to laboratory work rather than practice, and these men should be permitted to make their fifth year a laboratory years. There is likewise a small percentage of men in each class who intend to go in for specialties. These men, in my opinion, should be required to take their hospital year in a hospital with a general service, and should not be allowed to take special studies along the lines they ultimately intend to follow without this general experience.

At the present time the main difficulty in the way of a satisfactory fifth hospital year lies in the hospitals themselves. Many of them are inadequately equipped, the attending service is very uneven in quality, and the thoroughly bad American system of rotating services prevents a continuity of policy and an even quality of training which are necessary in order to give the student a satisfactory fifth year. In other words, to use plain language, the members of the visiting staffs of many American hospitals are not competent to give satisfactory instruction to fifth-year students. Under many members of hospital visiting staffs, the students would learn superficial habits of observation, and careless methods of keeping records and following out treatment. Very few medical schools would care to be responsible for this kind of work, and put their seal of approval on a student who had been trained in this manner. Of course, I am fully aware that there are some men connected with hospitals who are capable of proper teaching, and able to give sufficient time to it. My experience, gained through connection with a number of hospitals, leads me to believe that these men are exceptional.

It would certainly be impossible at the present time for every medical school to give its students a satisfactory fifth hospital year in a hospital or hospitals completely controlled by the school. This is especially true of the big medical schools of the large centres with their large classes; so that, while I am in favor of a fifth hospital year, so long as the average American medical school is as deficient in practical clinical training as it is at present, I am of the opinion that this fifth year cannot be put upon a satisfactory basis until the American hospital system has been revised. The proposed hospital inspection and classification by the Council on Medical Education will undoubtedly make a beginning in the right direction and is likely to lead to hospital reform.

EXTRA YEAR SHOULD BE MOST PRACTICAL.

GEORGE DOCK, M. D.,
Sometime Dean of the Medical Departments of Tulane University and Washington University,
St. Louis, Mo.

We need more time for teaching medicine. The transfer of a certain amount of chemistry and biology to the pre-medical course still leaves the medical year so crowded that the best arrangement of a curriculum seems to be impossible.

I do not suppose that you mean the fifth year may be purely didactic; a whole year of didactic work, I should think would be an anachronism. Even such work as demonstrations, lectures and the larger clinics should be utilized very sparingly in an additional year. By far the greater part of the time should be devoted to actual work of all kinds such as the physician should be able to do and especially in all of those things that he should be able to do well as soon as he gets into practice.

A PLAN FOR A STANDARD CURRICULUM.

JAMES W. HOLLAND, M. D.,
Dean of Jefferson Medical College; Member of the Council on Medical Education of the American Medical Association,
Philadelphia.

Starting as a basis, on a standard four years' high school education, I favor the following plan for a thorough medical education as the best and most feasible by the American medical colleges:

First Pre-medical College Year.—Physics, Chemistry, Biology.

Second Year. (Freshman Medical.)—Anatomy, Embryology, Physiology, Physiological Chemistry, Pharmacy and Materia Medica.

Third Year. (Sophomore Medical.)—Anatomy, Physiology, Clinical Chemistry, Pathology, Principles of Surgery, Physical Diagnosis, Hygiene, Medical and Surgical Clinics.

Fourth Year.. (Junior Medical.)—Pathology, Post Mortems, Bacteriology, Obstetrics, Therapeutics, Practice of Medicine, Applied Anatomy, Operative Surgery, Hospital Clinical Laboratories, Didactic Teaching in Specialties.

Fifth Year. (Senior Medical.)—Special Therapeutics, Clinical Medicine, Surgery, Obstetrics and the Specialties, Ward Work in Hospitals.

Sixth Year. (Extra Mural.)—At least one year in a hospital as intern.

FIFTH YEAR MEN SHOULD SERVE AS INTERNS.

HERBERT U. WILLIAMS, M. D.,
Dean of the University of Buffalo, Medical Department,
Buffalo, N. Y.

I can only give my personal view relating to the advisability of having a fifth year in the medical curriculum. It is my opinion that the most important improvement that could be introduced in medical education would be to require every medical student to take an additional year, provided that year should be spent in a hospital where the student had a position as intern. Such a change would require action on the part of the legislatures of the various States; in Minnesota, I believe this plan is already carried out. As a preliminary move it would be necessary to have a census made showing the number of hospitals and the number of positions available for interns; I believe the American Medical Association has an examination of hospitals in view. I have no doubt but there are enough positions in hospitals to take care of all medical students. Practically all of our own graduates—90 to 95%—now secure positions as interns.

FIFTH YEAR DEPENDS ON ENTRANCE REQUIREMENTS.

CHAS. CHASSAIGNAC, M. D.,
Dean of the New Orleans Polyclinic(the Post-Graduate Medical Department of Tulane University,
New Orleans, La.

I am not yet prepared to urge the adoption of the five year course, believing that it depends a great deal upon the entrance requirements and their proper enforcement. While open to conviction, I am yet of the opinion that if a man is properly prepared, a four year course, which gives adequate attention to the clinical and hospital features, can be sufficient. On the other point, however, I can be much more emphatic, as I feel quite convinced that should a fifth year be decided upon, said final year should be devoted to hospital and dispensary work which, of course, would include laboratory practice.

WOULD MAKE HOSPITAL WORK NECESSARY FOR A DEGREE.

MAURICE J. LEWI, M. D.,
Late Secretary of the New York State Board of Medical Examiners; President of the School of Chiropody,
New York.

I am in favor of adding a fifth year to the curriculum of the medical college, but would do it gradually:

The student having satisfied the faculty of the medical school that he has completed his four years' work with credit, he should engage in either hospital or dispensary practice for six months, at the end of which time his diploma would be awarded. Two years after the adoption of this idea I would prolong the course of hospital work either in the dispensary or as an intern for six additional months,, so that in 1916 no person could be admitted to a New York State licensing examination unless graduated from a registered medical school, which registration would mean four years of regular work along the lines of the college curriculum supplemental by one year of active service in a registered hospital, six months of which latter time might be credited as hospital work if it represented dispensary medical service. The medical school should not award the diploma until the full five years' work shall have been done, unless the student wishes to complete his studies in another State or foreign country.

A PREMEDICAL YEAR FAVORED.

CHARLES P. EMERSON, M. D.,
Dean of the Indiana University School of Medicine,
Indianapolis, Ind.

While undoubtedly more medical education is desirable before our graduates enter active practice, a fifth year as now spent in Germany is not a success there, and doubtless would be no more of a success here unless we changed the system somewhat. We would not be as likely to make a success as the Germans are, since they succeed in having all their interns do research work during their intern year, while it has been found very difficult to accomplish this in this country.

My own idea is that the extra year would better come between the college course and the medical course, and that during this year very thorough courses in chemistry, physics and biology be given; courses which are based upon that same work in the college, but carrying it to a further point and having especial bearing on medicine. Our graduates are realizing each year more forcibly the value of a year in a hospital and I believe that all who can will get that whether or not it is required.

UNIVERSITIES SHOULD AID MEDICAL SCHOOLS.

R. L. WILBUR, M. D.,
Dean of the Department of Medicine of Leland Stanford Junior University,
San Francisco, Cal.

I feel strongly that the drift of medical education in this country is toward the addition of a compulsory hospital year to the medical curriculum. If the universities could arrange to handle the work of the first year in medicine, the chemistry, physiology, biology, embryology, etc., and the medical schools raise their requirements so that they would only admit medical students upon completion of that work, it would greatly facilitate the introduction of the hospital year into the medical curriculum and would relieve the medical schools somewhat of the great burden which has been placed upon them by the advancing standards of medical education and the necessary changes accompanying modern medical instruction.

SPEND THE FIFTH YEAR IN ACCREDITED HOSPITALS.

PAUL G. WOOLEY, M. D.,
Dean of the University of Cincinnati,
Cincinnati, O.

I think it is unimportant whether the colleges themselves add a fifth year, or whether the State boards require an intern year of applicants for license to practise.

I feel that the so-called fifth year is essential, and I believe it should be devoted entirely to hospital and dispensary work, but I also think that such a intern year should be spent by a student in a hospital that furnishes every facility for thorough clinical work. A hospital that does not have adequate laboratory and library facilities cannot be expected to furnish students with the experience he needs. Interns from such hospitals should not be accredited by State boards.

For the purpose then of establishing a real fifth year, the hospitals of the United States should be inspected in much the same way that the medical schools have been inspected by Mr. Flexner, and the results of the inspection should be published.

REASONABLE ENTRANCE REQUIREMENTS AND STRONGER CURRICULUM.

WALTER CAPSHAW, M. D.,
Professor of Anatomy in the University of Oklahoma,
Norman, Okla.

The question of adding a fifth year to the present four year medical curriculum, and what this year shall be devoted to, furnishes a very live subject for debate. It is such a one as would cause physicians or educators to ponder well before declaring themselves, and one would feel like having a few strings to his decision after it was made. Naturally one does not feel like venturing an opinion without making considerable explanation and using a number of if's and but's.

Personally I am in favor of a five year curriculum, and I would say that the fifth year be confined to hospital and dispensary work, or possibly to serving as an assistant to some practicing physician. This I believe would be of far more advantage to the young physician than a continuation of lecture and laboratory work interspersed with clinics.

The present trend of medical education is undoubtedly upward, especially in the amount of time demanded of the student before he is granted his degree, but I am not so sure the quality of physicians we turn out is proportionately better, and undoubtedly the lengthening of time required is eliminating a considerable amount of good material for future doctors. It has been my experience that our most earnest students are those to whom time is a most important factor, and whose advantages are not good. I am not in favor of continually raising entrance requirements and at the same time lengthening our medical course. It seems to me it is almost like class legislation and not exactly fair. It almost means the same as saying, "If you have the means you can study medicine," if not get into a class where you belong and do not think of being a doctor. Theoretically it sounds good to say that a person will make a better doctor if he has a high school education, a degree in arts or science from some college or university, and then spends five years studying medicine for his doctor's degree; but I believe that the other fellow, who has been excluded because of all these requirements, but yet may have the ambition, the instinct, and other natural qualifications for making a good doctor, would have made as good or a better one in a less number of years. I believe if we demanded a higher quality of work of students rather than a greater amount of time we would have a better class of doctors. If we could agree upon a standard of entrance requirements, and a standard curriculum and adhere closely to them we would be better off. Two years of college work as a standard entrance requirement and a five year medical curriculum would make a satisfactory standard for some time to come. Briefly I would divide the five years about as follows: Three years of lecture and laboratory work for the fundamentals and ground work, the fourth year for clinical lectures and demonstrations, and the fifth year confined altogether to practical work with the young physician left to his own resources as much as possible. I believe that learning to be dependent upon himself is one of the chief necessities for a young physician, and this confidence I would expect him to acquire in a fifth year.

Concluding I would like to say that I am in favor of a continuity of courses. If we say that the curriculum shall consist of five years of nine months each, I do not see why anyone who has the means and inclination to do so, should not be allowed to follow one period of nine months immediately with the second, third, etc., for forty-five consecutive months, and not that each of these periods must be confined within a separate twelve months. A stronger medical curriculum with a reasonable standard of entrance requirement is my idea.

RECONSTRUCT THE CURRICULUM FIRST.

ROYAL S. COPELAND, A. M., M. D.,
Dean of the New York Homeopathic Medical College and Flower Hospital,
New York.

I am impressed with the idea that the rapid evolution of medicine has resulted in a large number of what I may call unassimilated additions to the medical curriculum. It seems to me that the first step toward improvement is a study of the present curriculum with a view to its more scientific arrangement. The so-called specialties have so increased in numbers and importance that the temptation has been to add large amounts of instruction in subjects, the teaching of which is the function of the graduate school. Naturally, the teacher who is a specialist is anxious to impress upon the student the possibilities and positive value of his particular subject, without considering that the student must meet a dozen other men, likewise specialists. He crams so much down the throat of the student that the mental stomach is soon crowded with unmasticated lumps of information.

It seems to me that our first effort should be to revise the medical curriculum, analyze the teaching of our specialties, and limit this instruction to those subjects and to that much of each subject that will result in an all-round practitioner. When this is done I am sure there will be found plenty of time in the four years now allotted to medical study, to thoroughly cover the subject.

Personally, I do not object to adding a fifth clinical year. As I stated at the Educational Conference at Chicago two years ago, I can see the value of deferring the granting of the degree until the student has spent a year in a hospital. I favor this idea, not alone because of the value to the medical student, but also because I believe this plan will result in a vast improvement to the hospitals themselves. It will mean that hospitals will be inspected as colleges now are and some central body will demand equipment, service and attention to detail, such as our hospitals now lack. Furthermore, hospital boards will have such a hold upon the intern as will make it possible to require from him a much higher quality of service than is now ordinarily rendered.

My response on this subject then is: I do not object to the adoption of a fifth year, provided we first reconstruct the present curriculum, and provided the fifth year is devoted to hospital work.

MORE PREPARATORY WORK FAVORED.

J. Newton Roe, M. D.,
Secretary of the Chicago College of Medicine and Surgery, Medical Department of Valparaiso University,
Chicago, Ill.

Regarding the proposed extension of the medical curriculum to five years, my personal opinion is that the public high schools should prepare any one to enter any professional course of study, and by this I mean such courses as Law, Medicine, Dentistry, Engineering, etc. If the medical curriculum is extended to five years the first year should consist of studies both didactic and laboratory, in the branches of medical chemistry, medical physics, biology and pharmacy. There should be no clinical instruction in the first year of such proposed curriculum. The branches mentioned should be studied with the end in view of studying medicine, and the first year of the regular four years' course in the university leading to the Bachelor's degree is not the equivalent of the first year of the regular five year course which is proposed. In other words, the first year of the regular four year course in a university ought not to be considered the equivalent of the first year of the proposed medical curriculum of five years.

PRACTICAL WORK FOR FIFTH YEAR.

David Streett, M. D.,
Dean of Baltimore Medical College,
Baltimore, Md.

It seems to me that owing to the crowded condition of the medical curriculum it would be well to extend the course to five years, devoting the instruction of the fifth year entirely to hospital and dispensary work with the clinical instruction given with such work. If a fifth year is to be added, it is my opinion that the instruction of such year should be of a very practical nature. The adoption of the fifth year if devoted to hospital and dispensary work with the clinical instruction required would work no hardship to students since nearly all of them now take one year in a hospital after graduation. This they would not have to take if the fifth year was spent in such work prior to graduation.

FIFTH YEAR MUST BE UNDER UNIVERSITY SUPERVISION.

E. P. Lyon, Ph. D., M. D.,
Dean of the St. Louis University School of Medicine,
St. Louis, Mo.

We have a five year medical course in this institution in the sense that we have placed so-called premedical college studies distinctly in the Medical School. The biology, general chemistry and physics are taught as medical subjects and from a medical standpoint. However, I understand that you mean by a fifth year an added year at the other end of the curriculum. I am in favor of such a year to be spent distinctly as an intern in a hospital under the direction of competent instructors, as soon as the medical schools shall have gained proper control over the hospitals. At the present time the schools cannot put their students into hospitals over which they have sufficient supervision. Such a year would really be of value only when spent under university auspices and in a scholarly atmosphere.

I was much interested to see in Mr. Flexner's report on medical education, that the required hospital year in Germany has not worked so well as was expected and has led students to neglect the clinical facilities available during their last year in the university. I think that we should so control matters here when we introduce the fifth year, that this could not happen. For a limited number of students who may be thinking of doing medical teaching, a year in laboratory work could properly be accepted in place of a year in a hospital. The same would probably be true of dispensary work under proper conditions.

GENERAL CONSENSUS OF OPINION FAVORABLE.

Horace D. Arnold, M. D.,
Dean of the Graduate School of Medicine of Harvard University,
Boston, Mass.

The question of adding a fifth year to the curriculum of medical colleges has been discussed during the past two years in the Conferences on Medical Education and at the meeting of the Association of the American Medical Colleges. The general consensus of opinion seems to be in favor of the plan as soon as it is practicable. These organizations have the matter in charge and are collecting information which will help in solving the problem of its practicability.

AN ADDITION OF VALUE.

Addison S. Thayer, M. D.,
Dean of the Medical School of Maine of Bowdoin College,
Portland, Me.

For many years the proportion of our students who have spent a year or more in hospital work immediately after graduation has been steadily increasing until for the last half dozen years nearly all of our graduates have sought and received this experience. Every year we receive from hospitals requests for interns—many more than we are able to furnish. Individually, I believe that an addition to the four-year course of a fifth year devoted to hospital work would increase the value of a medical degree. Our faculty has passed no vote concerning this question.

FIFTH YEAR OF CLINICAL INSTRUCTION VALUABLE.

Thomas D. Crothers, A. M., M. D.,
Dean of the College of Physicians and Surgeons,
Boston, Mass.

This college was in all probability the first in New England to adopt a five year course. This was some years ago, and was the result of the intense rivalry of other institutions to keep this college from clinical facilities in hospitals. Later the Common Council of Boston enacted that all colleges should have equal privileges in the hospitals and dispensaries for medical instruction. This removed the necessity of insisting on a fifth year study course. While we urgently recommend it to all students, a diploma is given at the end of four complete years of study, and for the fifth year a special certificate is granted. No fees are required for this extra year.

In our experience nearly all the graduates take another year, either as interns in hospitals or assistants to physicians in public institutions.

A fifth year of clinical instruction is very valuable and commends itself to all students who wish to be thoroughly equipped for the requirements of modern practice in medicine. While struggling to meet the requirements of the times, for higher education, we are forced to meet the conditions with the best possible means at our command.

BELIEVES IN AN EXTRA CLINICAL YEAR.

Winslow Anderson, M. D., M. R. C. P., London,
President of the College of Physicians and Surgeons,
San Francisco, Cal.

I am thoroughly in accord with a five years' medical course. The fifth year in my judgment, should be entirely clinical and spent in some well-equipped hospital.

FIFTH YEAR FOR GENERAL HOSPITAL WORK.

H. E. FRENCH, M. D.,
Dean of the College of Medicine of The University of North Dakota,
Grand Forks, N. D.

The School of Medicine of the University of North Dakota does not give a full four years' course; it gives two years of premedical work and two years in medicine; and so my opinion may not be especially valuable. I believe, however, that American medicine should adopt the five year course. The fifth year should be hospital work, and I am inclined to think that it should be general hospital work even for the man who is fitting himself for laboratory or research work.

ADD AN INTERN YEAR.

ARTHUR R. EDWARDS, M. D.,
Dean of Northwestern University Medical School,
Chicago, Ill.

So much has been done to raise requirements for admission to the medical school, that I believe an addition should be made to the end of the medical course. The customary four years are unreasonably overcrowded with work, and the fifth year, if added, should be as an intern year.

HOSPITAL YEAR AN ESSENTIAL.

ALFRED L. GRAY, M. D.,
Dean of the University College of Medicine,
Richmond, Va.

The medical course has, in my opinion, been entirely too crowded for many years. In the four years given by the majority of the better schools, the student has entirely too little time to apply the knowledge which he should have thoroughly obtained to actual practical experience. I am heartily in favor of adding a fifth or hospital year to the curriculum.

FOUR LOGICAL REASONS IN OPPOSITION TO A FIFTH YEAR.

CHARLES MCINTIRE, M. D.,
Secretary of the American Academy of Medicine,
Easton, Pa.

It is difficult to express my opinion on this important subject in a paragraph because I am not in favor of the additional year.

Briefly, however, first: It is well to remember what Mr. Flexner so well says in the report on medical education in Europe. "As the medical sciences increase in number and importance it becomes clear that the undergraduate student of medicine cannot do everything." If this be so, and I think no one would contradict it, the first thought in the arranging of a medical course is the determination of what he really can do or what are the essentials. Mr. Flexner in the same report calls attention to the necessity of a foundation for the physical sciences for the present day practice of medicine. I am of the opinion that safer medical advisors would be secured by spending more time upon the foundation studies and less upon the application of these foundation studies to medicine itself.

Second: I am of the opinion that much of the foundation training in the physical sciences can be given in a way to be more beneficial to the student if given in the preparatory course and not in the true medical course. If any more time is needed it should be put at the beginning and not at the end of the course.

Third: If the physical sciences are thus taught before entering upon the medical course, the time now occupied by their teaching can be utilized for medical subjects and the clinical teaching can find a place in a four-year curriculum.

Fourth: The time element must always be kept in view. As it is now the time of entering upon practice is unduly prolonged, so that the effort should be not to make the course longer but to so recast the entire course, co-ordinating the various scholastic departments, thus saving time. The training preparatory to actual practice should be the fundamental and essential subjects, leaving much that is now crowded into the medical curriculum for post-graduate work and professional study.

BEST MEN NOW GRADUATED ENTIRELY COMPETENT.

SAMUEL B. WARD, M. D.,
Dean of Albany Medical College of Union University,
Albany, N. Y.

We will all admit that there is no danger that the medical student will know too much on the day of his graduation, and it would be most fortunate if he could then know as much as Sir William Osler; but this is manifestly impossible, and Sir William would be very unhappy if he were obliged to settle down in a village of five hundred inhabitants, to remain some years, if not the rest of his life; yet each of these villages must have its physician.

I am well aware that it has been claimed that graduates of our best schools, who have spent sixteen years of study, amid the social and intellectual advantages of a city, to fit themselves for practice, have been contented in a small village, and have found the surroundings congenial. But I am far from being convinced that such is the case with all, or even a majority, of them. Most of them, if compelled to remain there, soon feel the lack of congenial intellectual companionship and lose their ambition. Nor in saying this, am I decrying the "country doctor." On the contrary, some of the most self-reliant, resourceful and competent practitioners I have ever met, have pursued their profession in country districts. As clinicians they would put many a "city doctor" to shame.

Nor am I unmindful that I am laying myself open to the charge of advocating "poor doctors for poor people"; I am doing nothing of the sort; the poor are entitled to have competent medical advice just as much as the rich; I am simply maintaining that a man may make a perfectly safe and competent practitioner without having spent years in the study of Greek, Latin and the differential calculus. There are plenty of instances among our good men in the profession to-day

It is my belief that the best men now graduated from our good medical schools are entirely competent, as far as the education to be derived from books and lectures is concerned, and that the only incompetents are those who have failed to thoroughly digest and appropriate what the schools offer. It is a well-known fact that the large majority of present graduates take a year in a hospital before going into private practice—at least such is the custom in this vicinity; and I am not one of those who would oppose having this made compulsory.

If a fifth year is to be added to the curriculum, I am decidedly of the opinion that it should be given up to practical, clinical work in a hospital.

THE FIFTH YEAR FROM THE LEGAL STANDPOINT.

ALMUTH C. VANDIVER, B.Sc., LL.B.,
Counsel to the Medical Society of the County of New York,
New York.

In the State of New York the statute requires the study of medicine in a medical school for not less than four school years of at least seven months each, in four different calendar years, as a qualification for licensing.

An amendment of the statute would be necessary to include a fifth year as a requisite to licensing.

"The ideal standard" now recommended by the Council on Medical Education of the American Medical Association as a prerequisite to the practice of medicine includes a final year as an interne in a hospital or dispensary.

The standard in full is as follows:

"(A) Preliminary education sufficient to enable the candidate to enter our recognized universities and in addition a course of one or two years devoted to the science of physics, chemistry and biology and to modern languages. These entrance qualifications are to be passed on by some competent authority not connected with the medical college.

(B) Four years in pure medical work, the first two of which should be largely spent in laboratories of anatomy, physiology, pathology, pharmacology, etc., and the last two in close contact with patients in dispensaries and hospitals in the study of medicine, surgery, obstetrics and the specialties.

(C) A final year as an interne in a hospital or dispensary should then complete the medical course."

The council also includes in its outline of the essentials of an acceptable medical college, the recommendation that as soon as conditions warrant a fifth undergraduate year should be required, which should be spent by the student as an interne in an approved hospital.

No State in the United States requires by law, at the present time, more than four years medical study for licensing and legislation would be necessary in practically all of the States to include a fifth year as a necessary requisite, although such legislation would not be necessary in all of the States to include a fifth year as a requisite to the granting of the degree of doctor of medicine by medical schools.

Germany now requires a year in hospital work before licensing.

Medical Education in Europe.

ENGLISH MEDICAL EDUCATION.

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"Our minds are endowed with a vast number of gifts of totally different uses—limbs of mind, as it were, which, if we don't exercise, we cripple."—Ruskin.

Those master minds who devised the system of medical education in Great Britain—especially England, must have been scholars of Ruskin for, from the cradle to the grave, the English medical man must needs be a student—he is seldom a graduate. While I speak advisedly, I speak with reservation—I should say a complete graduate.

To climb to the top of medicine or surgery in England, is done exactly as one would climb the English social ladder. It is a scheme of titles, degrees and decorations and then more title and more degrees. No Englishman can spend four or five years in the study of medicine and then, after getting a qualification which entitles him to practice, go to a distant city and announce that he is a specialist or a consultant. If he aspires to be a specialist or a consultant it means another degree or perhaps two or three degrees. The system of education is one of awards. Each added diploma, representing a reward for service to the public, or the profession is a rung in the ladder of education, and, should one receive all the desirable degrees, there is still something more valuable than money, to any Englishman, to work for—for in England, Knighthood is still in flower.

Let me particularize:

There is, in England, a General Medical Council which was established in 1858 and which has branch Councils in Scotland and Ireland, and controls the medical education of His Majesty's Kingdom. This Council consists of one person chosen from time to time, by each of the following bodies: The Royal College of Physicians, of London; The Royal College of Surgeons of England; The Apothecaries' Society of London; The University of Oxford; The University of Cambridge; The University of Durham; The University of London; The College of Physicians of Edinburgh; The College of Surgeons of Edinburgh; The Faculty of Physicians and Surgeons of Glasgow;

An individual chosen from time to time by the University of Edinburgh and the two Universities of Aberdeen, collectively;

One person chosen from time to time by the University of Glasgow and the University of Saint Andrews collectively;

One person chosen from time to time by each of the following bodies: The King's & Queen's College of Physicians of Ireland; The Apothecaries' Hall of Ireland; The University of Dublin; The Queen's University in Irelan; and six persons nominated by His Majesty with the advice of His Privy Council, four of whom are appointed for England—one for Scotland and one for Ireland and a president to be elected by the General Council. According to the Medical Act which was passed in 1858 and still exists almost in its original form, and to which the General Medical Council owes its birth, this Council is given a regulating power over the profession of Great Britain that is backed by the Throne, and the Lords Spiritual and Temporal and the Commons. Its word is law and it rules the medical colleges and the medical departments of universities as it does the general medical profession. It demands of Great Britain's institutions a standard of education. It governs the profession as a body and its arm is always long enough to reach the individual practitioner who would break any of its professional or ethical rules. It commands and demands respect not only for itself but for the practitioners it governs.

If a young man wishes to embark on a career of medicine, he must first take a preliminary Arts' examination. Such examinations are held in all cities of Great Britain and, to be recognized by the General Medical Council, as a proper standard, must include the following:

(a) English (Grammer, Paraphrasing, Composition, questions on English History and Geography);

(b) Latin (Grammar, Translation into English from unprescribed Latin Books, Translation into Latin of a continuous English passage, and of short idiomatic English sentences);

(c) Mathematics (Arithmetic; Algebra, including easy quadratic equations; Geometry, including the subject-matter of Euclid, Books I, II, III, and simple deductions);

(d) One of the following subjects:

(a) Greek (Grammar; Translation into English from unprescribed Greek books; Translation into Greek of short idiomatic English sentences); or

(b) A Modern Language (Grammar; Translation into English from unprescribed books; Translation of a continuous English passage, and of short idiomatic English sentences).

If he is fortunate enough to have been successful at this examination he may commence his studies for any one of the licensing degrees. To show that there is more than one degree for which he may study, I append the tables of registered diplomas and qualifications published by the General Medical Council:

TABLE SHOWING THE SEVERAL REGISTRABLE OR REGISTERED DIPLOMAS OR CERTIFICATES FOR PROFICIENCY IN SANITARY SCIENCE, PUBLIC HEALTH, OR STATE MEDICINE, AND THE DESIGNATION OF SUCH DIPLOMAS OR CERTIFICATES WITH ABBREVIATIONS USED TO DENOTE THEM IN THE *MEDICAL REGISTER*.

Licensing Bodies.	*Titles.*	*Abbreviations for Registration.*
Royal College of Physicians of London and Royal College of Surgeons of England	Diploma in Public Health	Dip. Publ. Health, R. Colls. Phys. Surg. Eng.
University of Oxford	Diploma in Public Health	Dip. Publ. Health, Oxfd.
University of Cambridge	Diploma in Public Health	Dip. Publ. Health, Camb.
University of Durham	Licentiate in Sanitary Science	Lic. San. Sci., Durh.
	Bachelor and Doctor in Hygiene	B. Hy., D. Hy., Durh.
	Diploma in Public Health	Dipl.. Publ. Health, Durh.
University of London	Certificate in Public Health	Cert. Publ. Health, London.
	Doctor of Medicine in State Medicine	M.D. State Med., Lond.
Victoria University of Manchester	Diploma in Sanitary Science	Dip. San. Sci., Vict.
	Diploma in Public Health	Dip. Publ. Health, Vict.
University of Birmingham	Diploma in Public Health	Dip. Publ. Health, Birming.
University of Liverpool	Diploma in Public Health	Dip. Publ. Health, Liverp.
University of Leeds	Diploma in Public Health	Dip. Publ. Health, Leeds.
Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow	Diploma in Public Health	Dip. Publ. Health, R. Colls. Phys. & Surg. Edin. and Fac. Phys. Surg. Glasg.
University of Edinburgh	Bachelor and Doctor of Science in Department of Public Health	B.Sc., D.Sc. (Publ. Health) Edin.
University of Aberdeen	Diploma in Public Health	Dip. Publ. Health, Aberd.
University of Glasgow	Diploma in Public Health	Dip. Publ. Health, Glasg.
University of St. Andrews	Diploma in Public Health	Dip. Publ. Health, St. And.
Royal Colleges of Physicians and Surgeons in Ireland	Diploma in Public Health	Dip. Publ. Health, R. Coll. Phys. Surg. Irel.
University of Dublin	Diploma in State Medicine	Dip. State Med., Dubl.
Royal University of Ireland	Diploma in Sanitary Science	Dip. San. Sci., R. Irel.

REGISTRABLE QUALIFICATIONS.

Licensing Bodies.	*Admitting Primarily to the Register.*	*As Supplementary Qualifications in Medicine, Surgery or Midwifery.*	*Abbreviation for Registration.*
Royal Col. of Phy., London	Licentiate	Fellow, Member, Licentiate	Fell., Mem., Lic., R. Coll. Phys. London
Royal College of Physicians of London	Licentiate and Member	Fellow, Member, Licentiate	Fell., Mem., Lic., R. Coll. Phys. London.
Royal College of Surgeons of England		Fellow, Member, Licentiate in Midwifery	Fell., Mem., Lic. Midwif., R. Coll. Surg. Eng.
Royal College of Physicians of Edinburgh		Fellow, Member, Licentiate	Fell., Mem., Lic., R. Coll. Phys. Edin.
Royal College of Surgeons of Edinburgh	Licentiate	Fellow, Licentiate	Fell., Lic., R. Coll. Surg. Edin.
Faculty of Physicians and Surgeons of Glasgow		Fellow, Licentiate	Fell., Lic., Fac. Phys. Surg. Glasg.
Royal College of Physicians of Ireland	Licentiate	Fellow, Member, Licentiate, Licentiate in Midwifery	Fell., Mem., Lic., Lic. Midwif., R. Coll. Phys. Irel.
Royal College of Surgeons of Ireland		Fellow, Licentiate, Licentiate in Midwifery	Fell., Lic., Lic. Midwif., R. Coll. Surg. Irel.
Royal College of Surgeons in Ireland	Licentiate	Fellow, Licentiate, Licentiate in Midwifery	Fell., Lic., Lic. Midwif., R. Coll. Surg. Irel.
Apothecaries' Hall of Dublin		Licentiate	Lic. Apoth. Hall, Dubl.
Apothecaries' Society of London	Licentiate	Licentiate	Lic. Soc. Apoth. Lond.
Apothecaries' Hall, Dublin	Licentiate	Licentiate	Lic. Apoth. Hall, Dubl.
University of Oxford	Doctor of Medicine,, Bachelor of Medicine, and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine, and Bachelor of Surgery, Licentiate in Medicine, Bachelor of Surgery	M.D., M.B., Bac. Surg., Lic. Med., Bac. Surg., Univ. Oxfd.
University of Cambridge	Doctor of Medicine, Bachelor of Medicine, Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine, Licentiate in Medicine, Bachelor of Surgery, Master in Surgery	M.D., M.B., Lic. Med., Bac. Surg., Mast. Surg., Univ. Camb.
University of Durham	Doctor of Medicine, Bachelor of Medicine	Doctor of Medicine, Bachelor of Medicine, Bachelor of Surgery, Licentiate in Medicine, Master of Surgery	M.D., M.B., Bac. Surg., Lic. Med., Mast. Surg., Univ. Durh.
University of London	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery, Bachelor of Surgery, Master in Surgery	M.D., M.B., Bac. Surg., Bac. Surg., Mast. Surg., Univ. Lond.
Victoria University of Manchester	Doctor of Medicine, Bachelor of Medicine	Doctor of Medicine, Bachelor of Medicine, Master of Surgery	M.D., M.B., Mast. Surg., Vict. Univ.
University of Birmingham	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	M.D., M.B., Bac. Surg., Univ. Birmg.

University of Liverpool	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	M.D., M.B., Bac. Surg., Univ. Liverp.
University of Leeds	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	M.D., M.B., Bac. Surg., Univ. Leeds
University of Edinburgh	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine, Bachelor of Surgery, Master in Surgery	M.D., M.B., Bac. Surg., Mast. Surg., Univ. Edin.
University of Aberdeen	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery, Master in Surgery	M.D., M.B., Bac. Surg., Mast. Surg., Univ. Aebrd.
University of Glasgow	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery, Master in Surgery	M.D., M.B., Bac. Surg., Mast. Surg., Univ. Glasg.
University of St. Andrews	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery, Master in Surgery	M.D., M.B., Bac. Surg., Mast. Surg., Univ. St. And.
University of Dublin	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine, Licentiate in Medicine, Master in Surgery, Bachelor in Surgery, Licentiate in Surgery, Master in Obstetrics	M.D., M.B., Lic. Med., Mast. Surg., Bac. Surg., Lic. Surg., M.A.O., Univ. Dubl.
Royal University of Ireland	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery	Doctor of Medicine, Bachelor of Medicine and Bachelor of Surgery, Master in Surgery, Bachelor in Surgery, Master in Obstetrics	M.D., M.B., Bac. Surg., Mast. Surg., M.A.O., R. Univ. Irel.

Having gained the right to study his chosen vocation, the matriculant has three roads open to him. He may study for a licentiateship, or membership in one of the Royal Colleges, he may study for the Apothecaries' diploma or he may enter one of the Universities and study for the M.D., or M.B. degree or for both. As the course of study for the Apothecaries' diploma and the Licentiate or Membership Degree is only five years, and the time required for the M.B. or M.D. degree is from seven to eight years, the majority of matriculants study for the former qualifications.

The rigidity of these examinations may be properly appreciated when one considers that after five or seven years of hard study, nearly thirty (30%) per cent. of the candidates are rejected. Having passed the examination and earned the right to practice his profession, he may or may not enter the field of active practice. In England, many physicians, having secured their license, continue to study for a consulting qualification (F.R.C.S. or F.R.C.P.), before entering active practice. A recently graduated doctor of medicine can often secure the F.R.C.S. or F.R.C.P. degree by devoting two more years to extra study—that is, in England. In Scotland and Ireland, one must spend from two to ten years before earning these coveted degrees. Statistics show that about ten to fifteen per cent. of candidates for consulting qualifications are successful. Let us suppose the ambitious student has gained a right to practice and then, after years of hard work in both hospital and private practice, he has successfully passed the Fellowship examination in medicine (F.R.C.P.). He now desires to become a medical officer of some Board of Health. Is he qualified? Certainly not. He must pass an examination for a diploma in public health. And so it goes—a degree has been arranged for almost everything.

In the first part of this article the writer spoke of the control that the General Medical Council had over the various schools, their examinations and degrees. The following clause extracted from the Medical Act will show how this standardizing is accomplished:

"The standard of proficiency required from candidates at the said qualifying examinations shall be such as sufficiently to guarantee the possession of the knowledge and skill requisite for the efficient practice of medicine, surgery and midwifery; and it shall be the duty of the General Council to secure the maintenance of such standard of proficiency as aforesaid; and for that purpose such number of inspectors as may be determined by the General Council shall be appointed by the General Council, and shall attend, as the General Council may direct, at all or any of the qualifying examinations held by any of the bodies aforesaid.

"Inspectors of examinations appointed under this section shall not interfere with the conduct of any examination, but it shall be their duty to report to the General Council their opinion as to the sufficiency or insufficiency of every examination which they attend, and any other matters in relation to such examination which the General Council may require them to report; and the General Council shall forward a copy of every such report to the body or to each of the bodies which held the examination in respect of which the said report was made, and shall also forward a copy of such report, together with any observations thereon made by the said body or bodies, to the Privy Council."

In every course of medical study in Great Britain, stress is laid on the practical or bedside study. In fact, theory is almost neglected. There are, of course, medical schools, but the student spends most of his time in the hospital and pathological museum. The public consultations which are usually held twice a week are especially instructive. Difficult cases are brought to the amphitheatre. The diagnosticians, the surgeons, the pathologists, the anatomists and the medical men are all present. Each examines the patient. The diagnostician gives his diagnosis—the medical men state what in their opinion should be done along medical lines for such a case. The surgeon under whose service the case enters, states the surgical treatment or operation he intends to perform. The other surgeons present state their experience with such procedures, under similar conditions. The anatomist gives his opinion regarding the technique of the intended operation.

The students listen and learn much.

MEDICAL EDUCATION IN GERMANY.

By Dr. Carl J. Herzog,
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The question of medical education in Germany will probably be better comprehended, if first viewed independently of all comparisons with the curriculum presented for medical students in other countries. Every country evolves a system of education most suitable for its own racial, temperamental and climatic conditions, and the German system, after centuries of trial, seems to have reached a status of development best adapted to satisfy all the factors concerned; while here

in America, with the possible exception of some of the Eastern States, the evolution of educational systems is still in lively progress, thus far with no clear prospect of a final uniformity.

The preliminary education of the prospective student of medicine in Germany is obtained in a gymnasium, a real gymnasium, or an Oberrealschule, where, in the order named, more or less stress is being laid on the classic or on modern languages on the one hand, and on "realistic" subjects, viz., the sciences, on the other. All of these institutions, which, as with all matters of education in Germany, are controlled by the Ministry of Education, have the right to confer upon the student who has successfully passed the semi-annual and annual examinations in each of the ten classes or grades, and a final examination under the direct supervision of representatives of the Ministry of Education, the certificate of "maturity," which entitles the holder to matriculation in any of the 23 German universities. The prospective student of medicine, who when entering the university is 18 years of age, must be efficient in Latin, which is not taught as an obligatory course in the Oberrealschule.

The first four semesters are taken up with studies in physics, chemistry, botany, zoology, histology, and above all, a thorough training in the theory and practice of anatomy. According the time-honored and jealously coveted privilege of absolute academic freedom, the student is free to choose his teachers and courses. He may study one term in Heidelberg, the next one in Berlin, and another one in Munich or even in Switzerland or Austria, and full credit will be accorded him. His aim is not to become an alumnus of one certain university and to imbibe thoroughly the college spirit of that particular institution, but to study under the most noted specialists in each branch of medicine. Neither does he ever have to answer a roll call; this, too, would be incompatible with academic freedom; the only check preventing the mistaking of this freedom for license being the prospect of the day of reckoning, the prescribed examinations. The first examination, the so-called Physicum, can at the earliest be taken at the end of the fourth semester. Its purpose is to give the candidate an opportunity to show that he knows enough of the propaedeutics of medicine to be admitted to the practical clinics.

Thus at the end of the fourth term the student, having successfully passed the Physicum, becomes a candidate in medicine proper. Again, for at least six more terms, he is absolutely at liberty to choose his university, or his lecturers, yet a good many clinics must be attended regularly, since at the end of the semester certificates regarding the attendance on such clinics are issued, and without these certificates no candidate is admitted to the first final examination. This first final examination can be taken at the end of the tenth semester, again under the all-regulating control of the Ministry of Education, and its successful passage entitles the graduate to call himself Medizinal-praktikant, and to practice medicine as assistant or resident physician at such hospitals as are designated by the Ministry of Education as up to modern standards of efficiency. It is only after from one to two years of assistantship at such a hospital, and a most rigorous second final examination in all the theoretical and practical branches of medicine, the so-called Approbations-examen, that the Medizinal-praktikant obtains his state board license, viz., is permitted to call himself Praktischer Arzt, and to start in private practice.

The title of doctor of medicine is conferred upon an applicant only upon presentation of a thesis on some original subject. Not before he has obtained his state board license, however, will the medical faculty of any of the 23 universities consider the application of a candidate for the degree of M. D. Thus there are plenty of Praktische Aerzte, viz., practicing physicians who have never gone to the trouble of writing a thesis and passing the examination prescribed by each university as requirements for the degree of M. D.

In regard to military service, to which every able-bodied German proudly submits, the medical student has some advantages inasmuch as he usually serves his first six months in the ranks, after having passed his Physicum examination. For the second half year he enlists as "volunteer" military surgeon, but not before having obtained his state license to practice, thus obtaining six months of valuable practice in his chosen profession.

For the study of dentistry the preliminary requirements are the same as for medicine, four years of studies being required before admission to the state examination for license to practice. A great many young men prefer, however, first to acquire the medical training and degree, and then to take up the special course in dentistry.

As some of the characteristic features of medical education in Germany we may point out, in concluding, this necessarily brief sketch, the following: A uniform high standard of preliminary education, a liberal course of special studies of at least six years under the guidance of the foremost men in their specialty, a uniformly high degree of scientific and practical efficiency among licensed practitioners, the safeguarding of the public's interests by an impartial controlling body in the form of the Ministry of Education, and the privilege and right invested in the license to practice in any state of the Empire.

MEDICAL EDUCATION IN LATIN COUNTRIES.

France—Italy—Spain—South America.

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New York.

In Latin countries medical curriculum lasts six years, but to have a fair idea of the education given in these countries compared with the education in America, it is necessary to take into consideration not only the years that the student has to spend in the medical school, but the years of preliminary education required for his admittance to the medical school, and how the general plan of education both general and medical is worked out.

In the Latin countries a student before being admitted to a medical school has to study altogether thirteen years; these thirteen years of study are divided into what is called elementary school for five years and eight in the classical and scientific school. Roughly speaking, the education received during these thirteen years can be compared to that received in this country from the primary school up to graduation from college. This is given either in private schools or in schools owned by the government or the city. A student graduated from the classical schools receives a degree by which he is admitted to the university. *In Latin countries the universities are owned and managed by the government which pays all expenses and appoints all the professors and makes out the program of the studies to be followed. In almost every large city there is one university, but only one; this university is the centre of higher education of the country, and includes many faculties;* that is, in the university of one city, like Rome, are included the faculties of Fine Arts, Science, Law, Medicine, Architecture,

Engineering, Pharmacy, etc. The medical school is only one branch of the big tree, the University of Rome. Any student who has been promoted from the classical schools can enter any one of the faculties. The requirements are exactly the same for every faculty, the only difference being in the duration of the course of study. *The study of medicine is the longest one, requiring six full years, at the end of which students receive their degree of M. D.* The person who has obtained his degree has the right to practice medicine in all its branches, including dentistry, which is considered a branch of medicine and for the practice of which is required a degree of M. D. All schools are open to all persons regardless of creed, race or sex.

With the general organization of education in Latin countries understood we can discuss the education given in medical schools. The six years can be divided into two periods of three years each. In the first period the student receives thorough instruction in the sciences allied to medicine; in the second period the instruction is essentially clinical. In the first three years students go through a complete course of physics, chemistry, botany, zoology and comparative anatomy. They are already conversant, in a general way, with these sciences through the education received in the classical schools; at the university these sciences are taught in relation to medicine, so in teaching botany the professor will insist on medicinal plants, and on the reproduction of the lowest species, which will be of future interest to the physician; in teaching chemistry the professor will insist on the chemical processes which relate to chemistry of drugs, and the general phenomena of organic chemistry of interest to the physician, and so forth for the other sciences.

During these three years a great deal of time is devoted to the study of anatomy, physiology and general pathology, as the fundamental basis of medical science. The study of anatomy begins with the first year and lasts three full years; physiology and general pathology are studied in the second and third years; histology, bacteriology and physiological chemistry are also studied in this period. All the courses are essentially practical, that is, the student has to make preparations and dissections under the guidance of the professor or his assistants. From the fourth year on the study is essentially clinical, the curriculum includes medical and surgical pathology, all the different clinics, such as medicine, surgery, gynecology and obstetrics, psychiatry, neuropathology, pediatrics, psychology, physical therapeutics, ophthalmology, otology, laryngology, rhinology, dermopathology and venereal diseases, medical jurisprudence, pathological anatomy, regional or surgical anatomy, operative surgery on the cadaver, materia medica and pharmacology.

The student has to follow all the clinical courses, assist the different professors and their assistants in the examination of patients and during operations is required to spend at least two weeks at different clinics, such as the maternity, the surgical and the medical. During his clinical courses the student is required to take the history and make the complete examination of several patients, with the assistance of either the professor or his assistants. He has to examine the different secretions, make as far as possible a diagnosis and a prognosis; he has in short full charge of the patient under the guidance of the professor or his assistants.

All the examinations are held in June and October and are essentially practical, requiring experiments and observation of patients before a commission of three professors. In clinical matter the student has to examine a patient, whom he does not know, make a diagnosis, prognosis, outline the treatment, examine the secretions and do whatever he thinks necessary to come to a diagnosis, prognosis and treatment.

The teaching of anatomy and pathology deserves to be mentioned. The course is divided into general and topographic anatomy. In the first three years the student has to study and prepare the different muscles, nerves, blood-vessels, etc., then either at the fourth or fifth year he has to follow the course which is called topographic or surgical anatomy. Anatomy is taught with reference to its practical side in relation to surgical and medical problems; the student prepares the different regions and has to show a fair knowledge of the general anatomy. The course is quite divided from the course of operative surgery on the cadaver, which is given by an entirely different staff.

Pathology is studied from every angle; the first period is devoted to general pathology, then medical and surgical pathology are thoroughly mastered, till in the fifth and sixth year pathological anatomy, that is, instruction in pathology given by dissecting cadavers and examining their organs completes the teaching of pathology.

The other great difference between this country and the Latin countries is in the way in which the clinical teaching is done. *Each and every professor has a special clinic of his own, where patients are treated under the absolute supervision of the professor and his assistants, and all clinical instruction is given in the clinic.* These patients come from the general hospital and there is an agreement between the general hospitals, which are all owned by the city, and the faculty, that is, the professor of a certain branch, as surgery, has the right to pick out from the patients who are admitted to the general city hospitals, the patients which he needs for his clinic, so, while he is teaching diseases of the digestive system he will try to pick out patients who are suffering from those disturbances which relate to the digestive system. In this way he can show with a fair number of patients the different stages of the disease and appropriate treatment.

Another great difference between the teaching in medical schools in this country and in the Latin countries is the teaching which is imparted by the *so-called private professors. In every university there are a number of professors who have no official appointment but who by examination or presentation of works of scientific value have been admitted to teach in the university.* The students can follow any official course or the course given by a private professor, that is, the private professor is giving a course parallel to the course given by the official professor, and the student is free to choose between them. When the examinations come the official professor is the president of a commission of three, which is composed of the official professor himself and of at least one of these private professors, so that the student has always a fair and safe chance whether he has followed the official teaching or the so-called private teaching. It is easily seen that this private teaching is a great stimulus for the student and for the professors themselves. Every one who is graduated in a special science can become a private teacher or professor, so that if the official professor is not very active or an old man who is holding his position for other reasons than purely scientific ones, the teaching in the university is really up to date just the same, because it is kept up to date by the private professors. Also in order not to lose his popularity the official professor is stimulated to work and keep abreast of time, because otherwise the students desert his course and follow the course of a very popular and progressive private professor.

Each year examinations are held and the student in

order to be promoted to the superior class has to have passed favorably all the different examinations. At the end of six years the student who has successfully passed all his examinations is admitted to present a thesis to the faculty. Theses generally are given by the professors to the students, who devote themselves to the development of the subject. The professors assist the student in the development of such a subject. It is well known that some of these theses developed in the French universities are really very good and very often quoted.

In July and October a commission of eleven members, generally six of the full official professors and five of the private professors, meet. These theses are presented to this commission, the student discusses the subject, questions are asked and if the commission should pass favorably upon the ability of the student he is given his degree of M. D. which gives him the right to practice all over the country. There is no state examination whatsoever. When a man has successfully presented and discussed his thesis he is admitted to practice medicine without any other formality; he is a full M. D.

A child begins to go to school at the age of six; he has to study nineteen years before he can obtain a degree of M. D., so that nowadays a person must be twenty-five years of age before he is graduated from a medical college and allowed to practice medicine.

75 West 55th Street.

A PROGRESSIVE ARRANGEMENT OF MEDICAL EDUCATION.

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New York.

The question of a fifth year to be added to the four now required to obtain the degree of M. D. is interesting because it shows that educators realize that four years of even the best instruction are not sufficient to make a person a proficient physician. But the question is: with the present organization and regulation of medical studies will a fifth year make a good physician out of a person, as the word good physician should be understood, and if not, what is to be done?

The medical school teaches the student the principles of medical science and after four years gives him a degree which entitles him to practice medicine in all its branches, as soon as he has passed the State examinations, which do not add anything to his medical knowledge. Being a doctor of medicine the young man has the legal right to perform any surgical operation or advise persons who are suffering from disease; in a word, he is given permission to do things which carry with them the very greatest responsibilities. *If we really want to improve the medical profession, we must understand that the recently graduated physician is not fit to take up the practice of medicine. He is not fit because he has had no actual personal experience; he has only learned the theory of medicine, but does not know how to practice it.* He has been accustomed to see patients only through the eyes of his professors and he generally observes only patients who are very ill. Suddenly all kinds of responsibilities are thrust upon him. It is hard to understand how the fun-loving college boy can change so radically and quickly as to be able to shoulder all the responsibilities connected with the practice of the most difficult and delicate profession. If we understand a physician to be a person who is not only intended to prescribe some combination of drugs, but as a man who is able to judge his patients and find out whether their troubles are real or imaginary, what the real causes of the diseases are, being in short a good judge of human nature, we will easily see what the young physician needs, before he is allowed to practice medicine alone. *Actual personal experience in the practice of medicine is an indispensable element to the good physician.*

It is possible for an ambitious person to obtain a degree of M. D. at the age of 21, but no one is fit to take up practice at that age.

In the four years passed in the best medical school the student spends very little time in actual personal contact with patients. While he is conversant with medical subjects, he has little or no familiarity with patients, but as soon as he is transformed into a licensed M. D. he has to deal exclusively with them.

To remedy this faulty condition, the student should be brought in contact with patients from the first year, and a fifth year added to be devoted exclusively to clinical teaching. Beginning with the first year the student should serve at least three months in hospital, starting from the bottom, methodically progressing with the examination of secretions, taking the histories, etc., until at the fifth year, he should in turn take charge of a ward, section of a dispensary or operating room. In this way he would become familiar with all sides of medical science, and know by personal experience what patients really need; how they should be handled, what has to be done and what has to be avoided. By a knowledge of practicality he would not neglect certain subjects, thinking them unnecessary, only to feel regret the more when in actual practice.

But even with the best clinical instruction in hospitals and clinics a person has to learn how to practice medicine. The knowledge of medical science is indispensable to proficient practice, but it is not sufficient to make a successful practitioner. The most scientific man might not be able to diagnose a common cold in a child because he knows not how to handle him. The majority of people consulting a physician do not need drugs or operations; more often they need only some good hygienic advice and encouragement, and when a young doctor is accustomed to deal only with hospital patients who really need surgical or medical attention, he is likely to see a serious condition, where a man of more experience knows, that the trouble is a very slight one, or vice-versa. The ability of judging patients is the most difficult part of the practice of medicine and one that is sadly neglected. We must not forget that Christian scientists and other faddists have so many followers, notwithstanding their absolute ignorance of medical science, because they study human nature, talk gently to their patients, study their psychology, and in this way obtain, at times, better results than regular physicians.

It seems to me that the only manner in which a young person can learn the actual practice of medicine is by practising with some one, who has experience and can teach him the finer points of the profession in relation to patients, to society, to himself and to his confrères. It is proposed that we should imitate lawyers; a young lawyer seldom opens an office independently, but associates himself with a successful man or a firm. The same thing could easily be done in our profession. There are in every town general practitioners who are overworked and who could easily take one or more young men just graduated as assistants.

Once established, that there are men willing to accept recent graduates as assistants, the practice of medicine should be regulated as follows: *Four years of medical education; one year of clinical instruction in hospitals; at the end of the fifth year the student is graduated, but before he is licensed to practice medicine independently one full year should be spent as assistant to*

some other licensed physician in good standing. No one should obtain a license to practice medicine who is not at least 24 years old. This arrangement would bring the time required to obtain a license to practice medicine to six years, as it is in the countries of Europe, with the advantage of giving the young physician a thorough training. In this way the medical profession would gain in the favor of the public, and would not lose a great number of patients to the cults. Numerous patients go to dispensaries only because they think that there they can get better advice than from a young general practitioner, but they would like to consult a general practitioner who has a reputation. Almost all these patients could be kept out of the dispensaries, if they could be treated by the successful practitioner through his young assistants. A moral advantage and one not to be overlooked, is that by eliminating the young, inexperienced physician, who on account of his lack of experience makes at times unpardonable mistakes, we would eliminate one of the greatest causes of lack of confidence in the medical profession.

Although it might not seem so, the one who would derive the greatest advantage from the above arrangement, would be the young doctor. When he starts practising he has no clientele; he has to await long hours without a patient; expenses are heavy and income light. From the busy life of the hospital he is plunged into the discouraging necessity of awaiting patients. The moral effect is depressing and he is likely to lose his ideals. When patients do come he has forgotten many of the principles on which medical science is based, and he is a poor physician. If he were to work under the supervision and advice of a more experienced man he would not lack these qualities; in addition he would have no office expenses, and whatever he made would be profit. In this way he could build up his own practice.

To summarize we think the medical profession needs to be improved in many ways. The public wants proficient general practitioners, and a proficient practitioner must have a thorough scientific and clinical education. A person should be of a mature age before undertaking the practice of medicine with its heavy responsibilities and that the only manner to make a successful practitioner is to give the young doctor the opportunity to practice, while he is at his best as far as scientific knowledge is concerned, that is, as soon as he leaves college, by making him assistant to an experienced man. This plan is advantageous to the public, to the profession, and to the doctor.

75 W. 55th St.

General Scientific

LARGE RETROPERITONEAL ABSCESS OF UNCERTAIN ORIGIN, DRAINAGE BY THE GROIN.

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Large collections of pus in the abdomen posterior to the peritoneum are infrequent, while those developing within the peritoneal cavity have been very common. When the presence of pus in the abdomen is recognized, even if its exact origin is not clearly determined, the usual procedure is to open the abdomen anteriorly over the suspected region, expose the abscess and after protecting the rest of the peritoneal cavity as well as possible by gauze pads, evacuate the pus through the abdominal opening already made.

In the case here reported, such an operation had been proposed to the patient. Had it been performed, the probability is that the result would have been much more serious to the patient than that which followed the operation which was performed. The case is thought worthy of being reported because it emphasizes the importance to the surgeon of a good working knowledge of anatomy, a fact which seems to need occasional emphasis at the present time. It can guide us out of some very dangerous situations.

The patient was a butcher, 50 years of age and weighing 190 pounds. He had always been in good health until the beginning of the present illness. He had had a right complete inguinal hernia for 30 or 40 years, which was probably of congenital origin. A short time before Christmas of 1907, he had a severe attack of abdominal pain with symptoms which his attending physician, Dr. W. Drummond, regarded as indicating obstruction of the ureter or intestine, or both. He remained in bed at this time for three weeks and discharged pus by the rectum. He had slight but somewhat similar attacks previously and he had observed that there had been diminution of the quantity of urine passed during the periods of pain with an increased flow after the pain had ceased. He had also what he called symptoms of inflammation of the bladder. Operation was considered by Dr. Drummond at the time of the first severe attack, but was postponed because of the improvement which soon set in and resulted in an apparent cure. The patient said that after this attack he became entirely well until about a year ago, although his wife says that he continued to have occasional painful attacks.

For at least a year previous to operation, he had been having more or less constant pain in the abdomen and considerable pain in various other parts of the body. It was most severe in the left side of the abdomen and in the corresponding lower extremity. He had frequent chills and creepy sensations, but continued at his work, although frequently compelled to sit down on account of pain and weakness. Fearing that an operation would be advised he had deferred calling his physician, but finally was prevailed upon to consult a surgeon, who diagnosed an abdominal abscess of some kind and advised an operation through the abdomen to evacuate it. He then called in Dr. Drummond again, and I saw him for the first time December 26, 1911.

He was lying in bed with his left thigh flexed slightly on the abdomen. When pressure was made on the knee to force it down to the bed, much pain was caused in the abdomen. Chills, fever and sweats had been severe for some time preceding. Palpation in the left iliac region, revealed a vague mass about the diameter of a child's head. There was some rigidity and considerable tenderness. The clinical picture was that of a pus collection which had existed for a long time. There was at the time no evidence of obstruction of the ureter, the urine was normal and clear and nothing was developed to indicate any disturbance of the urinary tract. Nor was there any sign of an intestinal disturbance to indicate an intestinal origin of the abscess. It was on the wrong side for an appendiceal origin. Left sided pain in appendicitis has been found

often enough and in such cases the appendix may be found reaching to the left side of the pelvis, but an abscess well up and out in the left iliac fossa is not likely to be due to an appendiceal infection.

Its seat of origin was a matter of much importance, for if it was of intestinal origin, the abscess would be intraperitoneal and could be best exposed and evacuated through the anterior abdominal wall. If the abscess were of ureteral origin, it would be retroperitoneal, and in the presence of few or no adhesions, if it were opened through the peritoneal cavity, the latter might be extensively contaminated and a fatal septic peritonitis result.

The patient had been told many years ago by an eminent surgeon, now deceased, never to permit any one to operate on his hernia. I urged that it be operated on, in order that through the hernia wound the hand might be introduced and the region of the abscess explored from within the peritoneal cavity. He finally consented and the operation was performed at St. Joseph's Hospital, December 27, 1911. The hand passed through the wound made for the Basini operation, found the peritoneal cavity free of adhesions everywhere, but in the left iliac fossa the normal prominence of the psoas muscle and usually well defined fossa external to it, could not be recognized. Instead there was a mound-like elevation which seemed to fluctuate. The hernia operation was completed and a collodion dressing applied. An incision, three or four inches long was made just below and along the outer half of Poupart's ligament on the left side, with the purpose of getting behind the peritoneum as it turns downward from the anterior to the posterior abdominal wall at Poupart's ligament. I had intended to work upward here until I reached the abscess, but peritoneum had hardly been reached when a very foul smelling pus began to escape and continued until a very large quantity had been discharged. The fingers introduced into the cavity of the abscess did not go far. They found themselves behind the external iliac vessels which suggested that exploration might easily rupture some branch of these or the internal iliac. After the pus ceased flowing the wound was cleansed and packed with iodoform gauze. A week later after a renewal of the packing a severe hemorrhage occurred but was stopped by a change of the packing. It did not occur again.

The patient was discharged from the hospital January 17, 1912, but remained in bed at home about three weeks longer and did not leave the house until two weeks later. The discharge slowly decreased in quantity and foulness of odor. The patient went back to work in April, but the sinus did not close completely until about eight months after the operation. He has remained perfectly well since and now weighs 250 pounds. The origin of the abscess still remains in doubt, although its retroperitoneal situation in the general region of the left ureter and the association of urinary symptoms in the early attacks, would seem to indicate a ureteral origin. Yet there should have been at some time unmistakable evidence of pus in the urine. This was never noticed by the patient. The incision in the groin constituted a very simple and safe treatment of what would have proven a very dangerous case with evacuation through the peritoneal cavity.

Onodi has cited fifteen cases in which he has found the canalis opticus communicating freely with the accessory sinuses, and he believes that it is often responsible for venous stasis in the optic nerve and extension of inflammatory processes.

THE NEW CHEMISTRY AND THE NEW MATERIA MEDICA.*

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Those who have followed materia medica for the last twenty-five years as impartial and unprejudiced observers cannot help but note, with increasing concern, the almost hopeless chaos and utter confusion into which it has been drifting, and are not at all surprised at the growing nihilism in the ranks of thoughtful practitioners. When we examine into the causes of this unsatisfactory condition, one factor seems to stand out most prominently, viz: *A general lack of knowledge as to the primary cause of disease.*

In a paper read before the Chicago Medical Society, February 15, 1912, the writer arrived at conclusions which were later supported by what would appear overwhelming evidence in an article published in the *Medical Record,* June 15, 1912, entitled: Facts of Modern Science, and Their Value in the Prevention and Cure of Disease."

Of those conclusions two are of special value for the purpose of this paper, viz.:

1. The primary cause of disease, from a purely physical viewpoint, is chiefly mineral starvation.
2. Minerals in inorganic form cannot be utilized by the human organism as directly and effectually as can true organic minerals.

If it be a fact that the primary cause of disease is mineral starvation, then it follows that the minerals must hereafter occupy a much more prominent place in materia medica than they are occupying at the present time. If it be true that minerals in inorganic form cannot be utilized by the human organism as directly and effectually as can true organic minerals, then it follows that the mineral remedies must be supplied in organic form.

What is the organic form? Organic chemistry designates as "organic" any "compound, substance or radical containing carbon." This definition is arbitrary and manifestly absurd because, if consistently applied, all of the carbonates, like soda, potash and marble, must be classed with "organic" salts.

The original meaning of "organic" is: Pertaining to objects that have organs, pertaining to the animal and vegetable kingdoms; resulting from, or exhibiting characteristics peculiar to, animal or vegetable life and structure. The basis of the inorganic world is the crystal.

The basis of the organic world is the cell, instead of the crystal.

The destructive effects of inorganic remedies have long been recognized, and efforts have been made to overcome their undesirable features. As a result a flood of so-called "organic" salts were brought to the attention of the physician, often accompanied by grossly exaggerated claims as to their therapeutic action and freedom from undesirable effects. It is now generally conceded that, with exceptions, these so-called "organic" salts are not much more efficient, if at all, than the purely inorganic mineral salts. The medical literature abounds with corroborative evidences, with the general effect that the much abused term "organic" has lost its true significance, and many physicians, as well as chemists, have

*Read at the Fourth Annual Meeting of the American Association of Clinical Research, November, 1912.

therefore come to the conclusion that there is no pronounced difference between "inorganic" and "organic."

Let us analyze the causes of the disappointing behavior of so many so-called "organic" combinations of minerals, and, if possible, find a remedy. All physical nature is divided into two great worlds of matter, the inorganic and the organic. The inorganic is generally known as the mineral kingdom. The organic includes the vegetable and animal kingdoms. We know that the substance of each kingdom serves as food for the next higher, and that in the process of digestion it is converted or transformed into substance of the higher. Thus the minerals supply the food of plants, but not in their crystal or unorganized form. In the process of becoming food the mineral must be raised from its unorganized condition in crystal form to the form of vegetable tissue. Hence, plants possess the power of converting or transforming mineral matter into vegetable tissue, plants raise inorganic matter to the state and condition of true organic substance.

The animal, like the human, cannot utilize minerals in crystal form as food, because it is not able to transform such mineral matter into animal tissue, the two being separated by a great gulf of condition, which is occupied, or bridged, by the vegetable kingdom. To become available to the animal the mineral must first become vegetable, that is, the inorganic must become organic. In other words, the vegetative process is provided by nature to bridge the gulf between the crystallized mineral and the tissues of the animal organism. After being lifted, or raised, to the higher condition of the organized vegetable tissue, the animal can easily raise it to the still higher condition of animal substance, and thus assimilate it without difficulty.

We are now able to understand why inorganic minerals are foreign matter to the human system; why their remedial effects are largely counterbalanced, and often outweighed, by their destructive effects; and why the minerals must become organic before they can serve as food and remedies. Chemical analysis reveals the fact that the organic world is composed of the same chemical elements that are found in the inorganic world. From the viewpoint of chemistry of to-day, therefore, the difference between inorganic and organic is not chemical in character.

On the other hand, everybody knows that inorganic matter is different in structure and condition from tissue substance. *Organic substance, therefore, is an allotropical modification of inorganic substance.*

For example: diamond and charcoal, in a purely chemical sense, are the same, viz., carbon. They are allotropic forms of the element carbon. The diamond is a crystalline or inorganic, and charcoal an amorphous or semi-organic form of carbon.

Marble is one of the inorganic, crystalline forms of calcium carbonate, and some of the organic colloidal forms of the same substance occur in the shells of eggs and oysters and in the valuable pearl.

Metallic silver is the crystalline or inorganic form, and Carey Lea's allotropic silver is an amorphous, colloidal or semi-organic modification of the same metal.

The yellow, poisonous crystalline phosphorus is an inorganic form, while the non-poisonous, red phosphorus is an amorphous, semi-organic modification. Countless other examples could be cited. In fact, the results already obtained in colloidal chemistry make it safe to proclaim that every known substance can be raised from the crystalline into the colloidal form. But the examples given here would seem sufficient to illustrate the fact that the crystalline form is characteristic of the inorganic world, while the colloidal form is characteristic of the organic world.

Since the middle of the last century chemists, biologists and physiologists have been engaged in the study of colloidal substance. Michael Faraday, Berzelius, Francesco Selmi, Carey Lea, and especially Thomas Graham, were the pioneers in this fascinating and fruitful field, which has grown into such dimensions within the last ten years that it has become a new branch of chemistry and bids fair to outgrow all the rest of chemical science and become the chemistry of to-morrow. Many workers in this field are beginning to sense the fact that colloidal minerals are Nature's bridge to purely vegetable substance. Some colloidal minerals, like dialized iron, colloidal silver, colloidal mercury, etc., are known to all physicians. They are known also to be less poisonous than their purely inorganic cognates. But many of them are not true organic substance yet, being merely stages of transition from the crystalline inorganic to the cellular organic. This has been demonstrated within the last few years with the aid of the microscopic and the ultramicroscope.

Just as it is possible to produce of the same substance almost any size of crystals, from the largest macroscopical to the smallest microscopical, so is it possible to produce of the same substance practically any size of colloidal particles, from the largest to the smallest ultra-microscopical. The microscope and the ultra-microscope reveal the facts that all particles of matter are in a state of motion or vibration, and that microscopical particles vibrate slowly while the much smaller ultra-microscopical or colloidal particles vibrate rapidly.

The crystalline inorganic is coarse in particle and slow in vibration. The cellular organic is fine in particle and rapid in vibration. The amorphous-inorganic and the colloidal semi-organic are intermediary steps.

And here we are face to face with Nature's Evolutionary Principle.

The evolution from the crystalline inorganic to the cellular organic appears to be accomplished by means of refinement of particles and increase of vibratory activity. We can now account for the fact that many so-called organic salts are not better than their inorganic forms. In the light of the foregoing the explanation is very simple. These so-callel "organic" salts are not organic in the true sense. They are merely loose associations of an inorganic element, or salt with an organic substance, which fact alone does not make the inorganic organic. A transformation of the crystalloid component into the colloidal form is required to make the compound organic in the true sense.

In other words, to be rightfully entitled to the designation "organic" the mineral element, or compound, must be

1. Raised to the colloidal form, and
2. Combined with a native organic substance (like protein, carbohydrate, fat, etc.).

For this true organic form of minerals the writer, in a previous paper, proposed the term "vito-chemical," to distinguish them from merely so-called "organic" minerals.

Briefly recapitulating:

1. Inorganic matter and organic material are the same in essence but different in form and structure.
2. The inorganic world is crystalloid. The organic world is colloid.
3. The inorganic is coarse in particle and slow in vibratory activity. The organic is fine in particle and rapid in vibratory activity.
4. Mineral bodies, *in organic form,* are an essential constituent of food and of the animal organism, and are of vital importance in the prevention as well as the cure of disease.
5. Crystalloid, or inorganic, minerals are not fit to serve as food or remedies for the animal organism. They will, therefore, eventually be eliminated from materia medica and replaced by vito-chemical, or true organic, minerals.
6. The smaller the particles of a colloid mineral, and the higher their rate of vibration, the better is it assimilated and adapted as a remedy.
7. Many of the so-called "organic" salts are not organic in the true sense because all, or part, of the compound is still crystalloid and not colloid.
8. The old chemistry, whose days are numbered, is unable to differentiate between inorganic and organic.
9. The new chemistry has not only made clear the difference between inorganic and organic, but also sheds its light upon a problem which in the old chemistry was one of the most profound mysteries, viz.: *Nature's Evolutionary Principle.*

THE IMAGINATIVE ELEMENT IN MEDICINE

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It would appear that the furtherance of medical progress is coming to depend more and more upon splendid imaginative powers in the practical man of affairs. Men like Carrel furnish examples of this rare combination. If the matter be looked into, this visionary or imaginative element, will be found at the bottom of very many of our achievements. We have always assumed, we Philistines, that the body as constituted possessed a healing power, in respect to wounds and broken bones, that was altogether the most ideal phenomenon in the whole realm of nature. Along comes Carrel, with his imagination in good working order, and with little use for the traditional assumptions, and starts work on the theory that it is feasible to enhance cellular multiplication many times. And behold! it is found that nature's old healing process can be expedited from three to forty times, according to modifications of the media in which the cells are activated. Or along comes Martin H. Fischer, and rejects the traditional assumption regarding the harmfulness of sodium chloride in nephritis. This idea concerning sodium chloride dates back to Hippocrates, if we are not mistaken. Did not one of the "Aphorisms" counsel against the use of salt in cases of dropsy? People believed for hundreds of years that a horse had a certain number of teeth, because Aristotle had stated the number in an arbitrary way. Then a Baconian counted the teeth and the Aristotelian tradition was pricked. The sodium chloride superstition is not the last of our erroneous beliefs to be shattered. There are others to come, awaiting the advent of imaginative iconoclasts. Fischer tells us that nephritis is due to a kidney acidosis. He produces a nephritis by the intravenous injection of an acid and then causes it to disappear by the injection of a concentrated sodium chloride solution. Albuminuria is due to the absorption of water on the part of the gelatinous colloid substance of the kidney, the latter thereby going into solution. This cannot happen in the presence of alkalies and neutral salts. Strange to say, all this was imagined independently by H. Lowenburg, of the Medico-Chirurgical College of Philadelphia, and in the *Pennsylvania Medical Journal* of December, 1912, he gives his brilliant results in eight clinical cases of primary and secondary acute nephritis, the sodium chloride having been given by proctoclysis in daily doses of from 180 to 300 grains. Lowenburg's work was done in ignorance of the experimental researches of Fischer. Possibly these gentlemen would disclaim any extraordinary endowment as regards imagination. Well, probably, Carrel would. Harvey would, were he alive. These poets of medicine would all talk about conclusions reached from clinical observation, etc. Pasteur would probably have been insulted had anyone called him a poet, a dreamer, or a visionary.

Wilhelm Ostwald, formerly director of the Physio-chemical Institute of the University of Leipsic, dreamed of a clearing house for the workers in science. There was once a time when one man, Berzelius, could keep track of all the advances in the field of chemistry and write an authoritative annual report thereon. "At present scientific production exceeds the human capacity for assimilating it." Already an international institution has been founded at Munich which is "seeking to introduce uniformity (as in the 'get up' of scientific books, periodicals and manuscripts, and in the cultivation of international language) and effect a saving of energy in those things which can be rendered uniform without prejudice to the main task of science." Ostwald's idea is to have a central station for the direct or indirect answering of any question which may be raised with respect to any field of intellectual work. The intellectual work already accomplished is to be organized, so to speak, and also, of course, that still in progress. "Just like a telephone central, Die Brücke (The Bridge) is intended to place every investigator in communication with every one of his fellow-workers and to unite his field of work with every other field." Here again we encounter the combination of dreamer and practical man of affairs. But first of all he saw the vision.

What a field cancer has been for the dreamer. We once heard some erudite person tell how many distinct theories had been recorded, and we have indistinct recollection that seven hundred and something was the number stated. The cancer problem will be solved by the most efficient dreamer. There are endless avenues of approach to this fascinating problem. Suppose we formulate one ourselves, "on the spot," as it were. Let's see what our imaginative powers are good for. But first of all, let us assure certain timid souls that we are not writing in any flippant fashion. We are just as much in earnest as any of the new literary schoolmen, like Bernard Shaw and Chesterton, but who nevertheless dare to approach sacred matters without undue gravity. There is a new spirit to-day in respect to how the great questions shall be handled. We know how the writers of the past approached these questions. They were so grave, and so frozen and fearful in the presence of them that their downcast eyes missed truth oftentimes. Well, then, with neither gravity nor levity do we formulate an hypothesis that is as plausible and as deserving of a try-out as any now under serious consideration in a marble-walled laboratory—perhaps more plausible and more deserving.

Cancer is exceedingly rare in the tropics. R. A. Lambert, working under the Crocker Fund at Columbia

University, has found that cancer cells are more vulnerable to heat than are normal body cells. High degrees of heat destroy sarcoma cells in a few hours (108.5 F. kills in from six to twelve hours; 109.4 F. kills in three hours; 111.2 F. kills in thirty-five minutes). It is impracticable to apply this clinically. Now if very high degrees of heat destroy cancer cells in a few hours, is it not reasonable to suppose that moderate degrees (e. g., 102 F.) of heat would also destroy them if long continued in application? This would be practicable, and G. Rueck, of New York, has shown how a moderate degree of fever can be kept up indefinitely for long periods by simple artificial means. Any one interested will find his article in the *Medical Record* of a few months ago. His experiments had no bearing upon cancer, but were undertaken to ascertain the effects of hyperthermy upon normal tissue processes and particularly upon the defensive mechanisms of the body. Also bearing upon our theory are the researches of Blagden and Fordyce, quoted by Castellani and Phalen (see *New York State Journal of Medicine*, November, 1912), which show that very high degrees of dry heat —240 to 260 degrees F.—do not disturb the body temperature, the heat regulating apparatus being able to take care of itself if the air is dry. But Phalen has also shown that with moisture at the saturated point, a temperature of from 92 to 98 degrees F. will raise the temperature of man about two degrees in four hours. These facts bear upon our theory in respect to clinical modes of application. The best way to try the theory out would be to place cancer mice under the conditions that Rueck devised for his tests and observe the results as regards retrogression. After all, as Ewing said in his recent paper in the *New York Medical Journal*, "the cancer process is very insecurely balanced." And, by the way, Ewing alluded in this paper to a case that is very suggestive in this connection—a massive cancerous growth, of typical character, which disappeared during the course of a moderate fever which continued for three months, the fever being due to some intercurrent affection. How erysipelas kills sarcoma, and how Coley has applied the fact, we are familiar with. Lintz (*N. Y. State Jour. of Med.*, Jan., 1913) got his best results in the treatment of cancer with Fischera's autolyzed human fetal tissues in a case in which the temperature rose to 104.

When we reflect that in the tropics the temperature averages about a degree higher than it does in the temperate zone (we mean the body temperature), according to the investigations of the United States Army Board for the Study of Tropical Diseases as they occur in the Philippine Islands, we can see the bearing this fact has on the rarity of malignant diseases in the hot regions of the earth, in the light of our theory.

Our imagination tells us that another theory may be adduced on the basis of the foregoing facts. Cancer may be conceived of as a lawless *growth* resulting from the mischievous activity of certain "forces" of the organism which for some reason are not normally harnessed, so to speak. Perhaps when the generative organs decay the "forces" which have been concerned in their activities become diverted and perverted. The piling up at some point of tissue of the epithelial type —selected because of its low grade in the tissue scale— is the result. Cancer is the poisonous mushroom among growths. The artificial induction of moderate, long continued fever, with its demand upon the resisting forces of the body, properly harnesses the energy mischievously engaged, and the growth retrogresses, as in the case cited by Ewing. The proneness of cancer to attack the uterus and female breast at or after the menopause is probably due to the atrophy and degenerative changes that take place in these exhausted organs at this period of life, which make of them *foreign bodies*, as it were, and therefore sources of local irritation, while at the same time the energies that have been concerned in sexual phenomena assume the mischievous rôle which we have discussed.

Cultivate the imaginative faculties—if you are a practical man of affairs. Medicine depends wholly to-day upon supermen of this type. But he who dreams only for the sake of the dream itself, who is only an example of the neurotic-arteriosclerotic school of "thinkers," "whose pride in reasoning, not in acting lies," whose castles in Spain cannot be constructed on the East Side for practical purposes—he should be sentenced to the Tarpeian Rock. There is no true genius that is not creative. The numerous near-geniuses whom we constantly encounter ought to be led gently but firmly to the Capitoline Hill, induced to open their veins, and persuaded to leap into space.

Professor Henri Bergson advocates a more frequent resort to intuition, guided by reason, in respect to the biggest problems of life. We think his method will have a definite place in medicine and supplement our scientific pedanticism, or rather effect wholesome changes in it. Bergson insists that the intuitive method in philosophy and practical life is not wholly unrelated to the scientific and denies that it involves only guesswork and mysticism; it is no more true to assert the latter than it is to say that science is wholly concerned with dry facts and nothing else. We may say that science studies things mostly from the exterior, whereas intuitive philosophy studies everything from the interior, in the main. We think that both methods must be taken into account and co-ordinated. There are altogether too many laboratory workers who need this kind of vision (they need it as a myxedematous patient needs thyroid extract); too many who are so immersed in isolated or loosely related problems that they cannot see the forest because of the trees; too many who entertain a cynical contempt for the "dreamers," who are assumed to be *always* unpractical, erratic and otherwise defective (which may be pardonable, though contempt for the dreams never is); too many who have to be directed by directors who possess every academic credential and every personal charm, but whose intellectual sympathies and intuitive horizons have too definite limitations; too many who go on forever piling up data upon data, like coral insects building a reef, or near-sociologists forever counting heads, and with the same automatic instinct; too many rhetoricians with their perennial announcements about their wonderful work and of being "on the threshold" of discovery; too many interested in the application of crude physical agents; too many who play with the tremendous elements entering into the cancer problem as the impossible game of croquet is played in "Alice in Wonderland," with the oddly behaving mallets and wickets, handled by still odder players. There is no mystery about the failure of the laboratory workers to solve this problem. They have been "on the threshold" of discovery for so long that it is about time they were indicted for incompetence and their places filled by the dreamers, who couldn't do any worse than they have. There has been altogether too much piffle uttered in this connection and the time is at hand for plain speaking about our hard-headed scientific pedants. The Carrel type, in which we witness a fusion of creative and practical genius, we would wish to see more to the fore.

There is a phase of this matter of imagination in

medicine which has a serio-comic aspect. Fortunately cognizance of it is confined, practically, to the medical profession itself, and it has not contributed to the gaiety of nations nor occasioned much professional chagrin. We are alluding to the imagination which detects in patients lesions which do not exist. We are somewhat tempted to write on this topic in Gilbertian fashion, but we shall refrain. Perhaps the less said about it the better. We have said some seemingly harsh things in this paper—though they have been said in what we believe the interest of the sick—so it is perhaps fitting that in conclusion we reveal a glimpse of the charitableness that is in every man's heart.

115 Johnson Street.

INFLUENCE OF PARENTAL ALCOHOLISM UPON THE HUMAN FAMILY.

LAWRENCE IRWELL, M. A., B. C. L.
Buffalo, N. Y.

In considering the influence of the male parent upon offspring, it is well to note that while some of the hereditary forces that influence offspring come from more remote sources than the actual parents, nevertheless, it is unquestionably true that the latter hold in their hands much power for good or evil as regards the vitality of their children. It is customary to consider that the greater share of the responsibility belongs to the mother, but some authorities do not admit this. In any case the share of the father is large. Professor Adami, of McGill University, has described a series of more than thirty cases in which fathers suffered from lead poisoning, while the mothers were free from this condition. The offspring were affected adversely as to mortality and showed signs of mental and other disturbances in a remarkable manner.

Again, a case which is typical of hundreds of others has been reported by the late Dr. Norman Kerr, in which, first were born a son and then a daughter, who both mentally and physically were excellent specimens of vigorous humanity. After the birth of the daughter, the father became a habitual drunkard. He had four more children, one of whom was defective in mind, while the remainder were complete idiots. Such facts as these can only be explained by admitting that the condition of the health of the father has a decided influence on that of his children. It may be that in this case there was a strain of initial mental defect in the father, which, when transmitted, was increased by the poisonous action of alcohol on the germ-plasm. Some investigators have found that the percentage of normal children of alcoholic fathers was as low as 6.5 per cent., while others consider that in their investigations it reached as high as 17 per cent. Assuming that tuberculosis may be found to the extent of about 1.8 per cent. in the progeny of healthy parents, it may be said to occur ten times as often in the children of alcoholic parents, showing that the offspring of inebriate fathers and mothers are specially liable to attacks of tubercle bacilli. It is true, of course, that alcoholic parents usually live in more unhygenic surrounding, than normal parents, and, as a natural consequence, the microbes of tuberculosis are more abundant in an alcoholic environment than in non-alcoholic surroundings.

Turning to maternal influence, there can be no doubt that the ultimate character and physique of a child is greatly affected by the mental and physical condition of the mother. That maternal influence plays a large part in the matter has been recently proved by scientific investigation in Europe which has established the fact that when the system of the mother is poisoned by lead, frequent miscarriages occur, while of the few children who are born, a large proportion are feeble and devitalized. Alcohol, lead and other protoplasmic poisons are all to be dreaded on account of their power of injuring the vitality of the unborn child. Alcohol has been shown to pass in appreciable quantity into the foetus. Can we be surprised, then, if serious results follow? As a matter of fact, numbers of children of alcoholic mothers are born more or less malformed or debilitated—or they are still-born. Upon the other hand, observation shows that the general vigor and level of health of children born to abstaining, and in other respects healthy mothers is markedly higher than the level of health of children of similar families in which both parents indulge in alcohol in quantity conversationally called moderate, but involving more alcohol than can be oxidized.

This evidence is, of course, far from conclusive. It is true that at birth many children of alcohol-consuming parents appear to be fat and well nourished, but the stamina of such children and their power of resisting disease often proves to be feeble, while that power on the part of the children of abstainers is, as a rule, satisfactory. Moreover, it is usually satisfactory, provided the mother's health is good, when the mother is an abstainer and the father a moderate drinker. In Dr. Sullivan's book on "Alcoholism," the author says that in a personal investigation he ascertained that of six hundred children born of a hundred and twenty alcoholic mothers, three hundred and twenty-five died in infancy, or were still-born, several of the survivors were mentally defective, and as many as 4.0 per cent. were epileptic. This investigation, however, was made in the United Kingdom, where alcoholism is very common, not in our country, where it is comparatively rare.

To sociologists it is evident that the question of maternal inebriety is one of national importance, for many women fail to realize that alcohol in small quantity, if taken every day, may have very serious results. Any community which is sincerely interested in the general efficiency of its members will be sure to safeguard the health of its women, for these, on account of their maternal functions, may either become the resuscitating and repairing element of the race, or else may provide many of the elements of deterioration which are so greatly to be dreaded, and which are, to some extent, in evidence at the present time.

The most serious consequences of the evil heritage of alcoholism falls upon the nervous system of the next generation. As a result, first of the deterioration of the germ-cells, and, secondly, to the impoverishment of the system of the mother during pregnancy, children born of alcoholic mothers often possess an enfeebled organization at birth. It may, of course, be impossible to recognize this condition very soon after the child's birth, although, even during infancy, many children of alcoholic parentage show impaired nerve vitality as is proved by convulsions, meningitis, etc. With regard to mental development, some children of alcoholic parentage exhibit signs of mental deficiency and lack of normal control, while others are the victims of epilepsy, hysteria and various unbalanced cravings. The characteristic mental trait of the child of the inebriate mother is a warped or stunted intelligence accompanied by impulsive, uncontrolled actions. Parental alcoholism tends to produce "impulsive degenerates" and moral imbeciles.

In dealing with the common forms of mental deterioration in children, it is, of course, desirable to

indicate in which cases alcohol appears to have an influence, but this is a difficult point. Most of the statistics on the subject are European. First, as to imbecility and idiocy. According to two English authorities, Drs. Shuttleworth and Beach, parental alcoholism is a factor in 16½ per cent. of the cases under their care at the Albert and Darenth Asylum for idiots and imbeciles. Analysis of 2380 cases shows that tuberculosis, epilepsy, mental disease, etc., in the parents form other factors, the history of intemperance being associated with one or more of these in the percentage given above. It should be noted that the sixteen per cent. named refers only to actual intemperance in one or both parents which, at the time when the investigation was made was the only point taken into account. In the light, however, of our present knowledge of the action of the regular ingestion of small doses of alcohol on the nervous system, it is not unreasonable to suggest that probably the depressing action of even ordinary quantities of alcohol upon the developing brain of the unborn child may be more profound than is at present recognized, and that, as a result, alcohol may be a more potent cause of idiocy than is usually believed.

That alcoholism in parents is a cause of insanity in children is undeniable. This is only what may be expected if we realize the extreme sensitiveness of the nervous system to many drugs, and its peculiar susceptibility to the effects of alcohol.

Concerning epilepsy, there is evidence that parental alcoholism is one of the most frequent causes of epilepsy in children. Epilepsy and imbecility often go hand in hand, but if we consider epilepsy alone, we find that alcoholic mothers possess a far larger number of children afflicted with epilepsy than do the ordinary mothers of the same social position. In this instance again, the only reliable statistics are European. In an investigation by Dr. Legrain (Social Degredation and Alcohol) as to the health of 220 children who had alcoholic mothers, it was found that 4.1 per cent. of the children became epileptic, while of the general mass of the population (United Kingdom, not United States) the frequency of epilepsy averages one-half of one per cent. Other authorities have found that from twelve to fifteen per cent. of the surviving offspring of alcoholic parents become epileptic. Dr. Legrain personally followed up the descendants of 215 alcoholics, and found that in these descendants epilepsy, insanity, and nervous disorders were extremely common. He also found that the families rapidly died out, a large number of the children dying young.

Three Cases of Spina Bifida.

Josef Simon describes three cases, two of which were myelo-meningoceles. (1) A male child, with a lumbosacral tumor; the child had also double club foot. He died on the tenth day. Besides the deformities cerebrospinal meningitis was found post mortem. (2) Female child with a tumor the size of an apple in the lumbosacral region. The child was well nourished, and was operated upon when three months old. All went well for some days, but after signs of paralysis in both legs the child died—nine days after operation. (3) Female child, with a swelling of the lower part of sacrum, operated upon when eight days old. The child, like the last, withstood the operation, but died eleven days afterwards. Despite these unfavorable results in the two cases, operation should be advised on all well-nourished children. Operation does save some children from an almost certain painful death a few months later.—(*Wien. klin. Rundschau,* 1911, xxv.)

Current Orientation

THE ARTIFICIAL PRODUCTION OF IMMUNITY FOR THE PREVENTION AND CURE OF DISEASE.

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Philadelphia, Pa.

IMMUNITY.

When an individual recovers from an attack of infectious disease he enjoys for a time of variable duration a protection against subsequent attacks of the same disease. He is then said to be immune. The term "immunity," however scientifically employed, designates a series of diverse phenomena concerned in the natural resistance of the animal body to attacks of disease-producing microorganisms. A study of the epidemiology of infectious diseases shows that whole communities often acquire an immunity against certain infectious diseases through their presence among the population for a number of generations. A very convincing illustration of this phenomenon is seen in the present pandemic of bubonic plague. Although this disease has spread to nearly every country in the world, Europe has so far remained free. We have only to recall the devastation of that continent in times past to appreciate the possibility that this freedom is due to at least a partial immunity to the disease among Europeans. In contrast to this condition is that of the United States, which, with the exception of a very few cases among man and rodent, has so far remained free from plague, probably only on account of its isolation and excellent sanitary precautions.

The production or heightening of the immune condition artificially is, therefore, one of our chief and most potent measures in the prevention and treatment of disease.

The first method adopted for artificially bringing about an immune condition in the individual was that of Jenner. This procedure consists of inoculating the patient with the virus of the disease itself in an attenuated or altered form, and has been very successfully employed in the prevention of smallpox and rabies.

The second method is that of employing killed bacteria instead of the living virus. In contrast to the first method, in which the nature of the immunity established is but little understood, that produced by the introduction of killed bacteria or their products has to some extent been reduced to relatively fixed rules.

It has been found that pathogenic bacteria rendered incapable of multiplication (or killed bacteria) are comparatively harmless when injected into the living organism, yet they excite the production of immunity bodies (or antibodies) against the disease of which the particular bacteria (in the living state) are the cause. The condition produced by the presence of these antibodies is known as one of "active immunity." Examples of its successful use are the elimination of typhoid fever from the armies of the world, the control of Asiatic cholera, etc. Antibodies may even be artificially produced in a healthy portion of a living organism for the purpose of supplying them, by way of the general circulation, to a diseased portion of the same organism. This procedure constitutes the employment of "active immunization" in treatment, or bacterin therapy.

The third method of producing artificial immunity consists merely in a transfer of immunity bodies from an immunized animal to the patient. It has been shown that immunity bodies are contained in a great part in the blood of an aimal which has become immune, and this fact has been taken advantage of in treatment, forming the basis of "passive immunization" or "serum therapy," as so effectively employed in the antitoxin treatment of diphtheria, tetanus, etc.

The distinction between bacterin (or vaccine) therapy and serum therapy should always be borne in mind. A bacterin is a solution containing the bacteria themselves or their toxins, while a serum (as evident from the word itself) is the blood serum of a horse or other animal which contains the immune bodies produced in the process of active immunization.

It takes but little observation to appreciate that almost any of the disease-producing microorganisms could destroy the total population of the world were it not for the resistive forces always present in the animal organism and which increase in a peculiar and specific manner under the stimulation of the attacks of the microorganisms themselves. The aiding or stimulation of these resistive forces by scientific methods is the most important advance in the history of medical science.

PRODUCTION OF IMMUNITY BY THE USE OF AN ATTENUATED LIVING VIRUS.

Vaccination Against Smallpox.

The fascinating study of the production of immunity against poisons and diseases dates back to remote times. Centuries before the Christian era the Chinese observed the immunity against a second attack enjoyed by those who had survived smallpox. By inoculation, i. e., artificial transfer of the smallpox virus, they endeavored to check the spread of the disease. The inoculation was carried out by placing smallpox scabs in the nose, rubbing into the skin, etc., and, strange to say, its entrance in this manner did seem to almost invariably result in a mild case of smallpox, recovery from which left the patient immune. The practice was also later extensively employed in Europe, but after a time it became evident that, while the immunity was secured in the inoculated person, the disease thus induced could be spread as readily as the natural form. Indeed, it is thought that the severity of some of the widespread and fatal epidemics was greatly enhanced by this procedure. The first really scientific step, then, in the artificial stimulation of the natural mechanism of immunization for the purpose of securing protection against infectious diseases may be accredited to Jenner, who in 1789, announced that immunity to smallpox may be produced by vaccination.

It had long been known that milkmaids after being infected by cowpox contracted from sores on the udder of the cow were immune to smallpox. It was, however, Jenner who first made a complete investigation of the phenomenon, and systematically employed it in prophylaxis.

The immense benefit conferred upon humanity by this scientific discovery may be estimated from the following facts and statistics. From 1761 to 1800, in the city of London, there was an average death-rate of 2,037 persons yearly from smallpox. It is estimated than in the 100 years from 1700 to 1800 an average of 600,000 persons died yearly from smallpox throughout the world. Smallpox is one of the most fatal and hideous of diseases. In the form of black smallpox practically all patients die. In the confluent form more than three-fourths die; in the semi-confluent form about one-half die, and in the discrete form one-fourth to one-twentieth. Those who recover are usually disfigured for life. Total blindness is a not uncommon result.

Effect of Vaccination.—In the early part of the 19th century, when smallpox, which had first assumed epidemic form in Europe in about 1700, had become a veritable scourge, suddenly it began to decline, and this decline continued for decade after decade, until the disease lost its terrors, and the great majority of physicians have never so much as even seen a case.

How was this almost miraculous change to be accounted for? There can be but one reply to this query. The introduction of protective vaccination by Jenner and its general adoption controlled and practically eradicated the disease.

Opposition to Vaccination.—There can now be little doubt that some of the early opposition to vaccination was due to the very sore arms that resulted from the use of infected virus. At that time nothing was known of pathogenic bacteria and the vaccine virus was produced in stables without any aseptic precautions. Thanks to the work of Pasteur, attention was called to the danger of contamination in vaccine virus and its manufacture put upon a scientific basis and placed under government control.

Modern Preparation of Vaccine Virus.—The modern production of vaccine virus is an interesting procedure. An elaborate equipment is necessary for its proper handling, and every precaution is taken to prevent contamination. The specially equipped establishments in which vaccine virus is now manufactured are situated on farms remote from the city, where the air is comparatively pure and wholesome. All of the operations are carried on under the direct supervision of an experienced propagator and careful tests carried out before it is distributed for use. A representative establishment of this kind is situated at Glenolden, Pa., ten miles from Philadelphia.

Vaccination Against Rabies. (Hydrophobia.)

Pasteur, recognizing that Jenner's method of immunization against smallpox could be applied to other diseases, made experiments with rabies, which resulted in a method of immunization against that disease. As in smallpox, the specific cause of rabies is yet undiscovered, but its course, characteristics and mode of transmission are such as would indicate bacterial origin. The virus consists of the spinal cord of rabid animals, usually rabbits, reduced in virulence by drying for a certain length of time over caustic potash. The incubation period in rabies is comparatively long, varying from three weeks to perhaps several years, while that of the attenuated virus is relatively short, thus making it possible to administer effective prophylactic inoculation after the infection of the patient by the bite of the animal.

(To be continued.)

When the normal circulation of respiratory air and the proper drainage of the middle ear are interfered with by an excessive growth of adenoid tissue in the nasopharynx it is generally agreed that it is wise to relieve the mechanical embarrassment by surgical means rather than by palliative treatment with local applications.

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DEFECTIVE MEDICAL PRACTICE LAW.

We are all painfully aware of the discrimination that is practised against educated physicians in that they are compelled to qualify before state boards of examiners, while all sorts of freak practitioners are left free to practise medicine, which is really what they do, despite the technicalities of the law which say apparently that they do not. The little clause in our own state law, exempting from its operation those whose medical practise is in some way indissoluby connectedwith established religion, while apparently just and sound, lets in the Christian Scientist—or ought to let him in—because it exempts those who practice circumcision as a rite and those who exhibit the relics of saints for the cure of the sick. It seems to us that if "fees" are collected for the performance of such rites that Christian Scientists have an equal right to collect fees for their medico-religious ministrations, and in the course of trials of such practitioners this fact should not weigh heavily against them. Our remarks are based upon the law as it stands. As a matter of fact we think our law grossly defective. It was framed in such a way as to attempt to give special privileges to certain religious bodies, and yet, when other religious practitioners throw their hats into the ring, they are prosecuted. It would seem that we can have no adequate medical practice law because no legislature would attempt to frame one. It is true that the law does not specifically name the religious bodies whose exemption is proposed, but the intent is obvious and practical results perfectly patent. It would appear that these bodies must always be taken into consideration.

But aside from these special considerations, we have to reckon with the quacks who find it possible to evade the law even though they have no religious affiliations to fall back upon. A law which in any way grants special privileges is not apt to be much respected in respect to any of its provisions. If it is grossly defective in part it might as well be defective *in toto*.

There is an army of defenders who have hit upon the expedient of "teaching" their cults to pupils. What is really a treatment is called a lesson. The yogis, and new thoughters, and "masters," and all the rest of the fakers and charlatans who hold forth at our fashionable hotels and other respectable places to audiences of social parasites of the sex "once our superiors, now our equals" ought to be prosecuted, for they are really practitioners of medicine without licenses. An adequate law would deal with these gentry in no uncertain terms.

As civilization becomes more complex evaders of medical practice laws will become more numerous, and unless the profession bestirs itself its unlicensed competitors will more and more jeopardize legitimate melical practice.

We place great reliance upon medical education of the public, trusting to the development and growth of a rational lay perspective as regards matters medical. But we cannot see that the little knowledge that the public has gained at our hands has accomplished more than the awakening of a morbid interest in freak systems. When medical men themselves are divided into schools, some of them obviously freakish, what can be expected of the public. The more *outré*, and mystical, and impossible the particular system is, the greater the interest of our highbrows.

All depends upon the character, force and authority of the profession itself, in the last analysis. The evils from which we suffer wax or wane according to its strength or weakness.

Every type of quack should be dealt with by a medically controlled society in the most drastic manner. The practice of medicine in every one of its phases should be strictly limited to regularly licensed practioners. The *Kansas State Journal* points out those to whom medical practice should be confined, and gives cogent reasons. It should be confined to that class of men whose members have made possible the digging of the Panama Canal, whose representatives are found on the battlefield attending the dying and wounded, who are found leading the fight against impure and adulterated drugs and foods, and who are meeting the invasions of contagious and infectious disease at every port and in every community. That such men should have to tolerate the presence, much less the competition, of the quack with his special cure for cancer, or the selfish charlatan who is in no sense whatever prepared to discharge the most elemental medical service to his fellow men, is a fact that smells to heaven and befouls the citizenship that permits it to obtain.

If our citizenship is not enlightened, a powerful profession must act for it. If the profession is not powerful enough to essay such a rôle then it is itself unfit and must take the consequences. The doctrine of *laissez-faire* has no proper place in twentieth century medical economics. This rôle of power the medical profession was destined to play in respect to all matters of public health, and must play if it is not to betray the plan of the fathers and the highest contemporary thought. If there must be a medical trust let it be born, and let swords be definitely crossed with the whole black cavalry of death.

Medical Social Service.

The social and economic problems of the hospital patient or convalescent and of the family unit of which he is usually a part are receiving intelligent attention at the hands of a constantly growing body

of social service workers. Inevitably, there have arisen perplexing questions as regards what seem to be the encroachments of these workers upon the field of organized charity. It is not definitely settled where social service ends and the constructive work of organized charity begins. There is not yet what might be called conflict, and so far a disposition to co-operate seems in the ascendency. To what extent the social service workers shall use relief funds seems to be a moot point. So far they have used rather small funds of this sort and their use has been very circumspect. There is a tendency in some quarters to resort to methods calculated to increase these funds largely, and to embark rather extensively upon relief work, in which field the social service people threaten to usurp the activities of the organized charity directors. It seems to us that there are large possibilities of severe future friction unless wise counsel be taken now. It is safe to say that the social service workers lack in many instances training in scientific relief work, and it is equally true to say that the organized charity people under-emphasize the medical phases of their activities. The former, many of whom are nurses, have a good appreciation of these medical phases. The latter use medical counsel to a considerable extent, but there is no thorough-going medical analysis of all of their cases. Such analysis, it seems to us, ought to be an essential part of the charity organization programme, since economic dependence is so very often related to disease, not infrequently in a way not at all apparent to any but the trained medical observer.

It may yet transpire that social service will overshadow the present relief societies, large and powerful and wealthy as they are. The very fact that it makes the medical phase of its work foundational gives it a competitive leverage that is very great. Moreover, it would appear that social service workers are more imbued with rational, wholesome economic views than are the conservers of private philanthropy. The charity organization societies are founded upon principles that are to-day fiercely beat upon by the fires of revolt against a social order which, in large measure, make the very sickness and pauperism, crime and prostitution, with which the charity arm of the conservative forces of society deals in a somewhat futile way. Their efforts are ostensibly constructive, but it is doubtful if their directors, in the main, are seriously considering fundamental reforms. On the other hand, social service gives ground for the hope that a mighty army of enlightened workers is in process of enlistment, gaining thorough information as to conditions and the real remedies therefor, unbound by the reactionary traditions and policies of an effete and ineffective philanthropy, devoid of the cynical attitude characteristic of the conservative classes, and unsympathetic, indeed impatient, with endless tinkering with pitiful end-results which the hearts and minds of a progressive civilization feel—or ought to feel—are largely unnecessary, in point of fact vicious anachronisms.

A New Type of Municipal Clinic.

New York City would do well to adopt a plan of dealing with the social evil similar to, or identical with, the Municipal Clinic of San Francisco, and this before many years have passed by. Sanitary regulations is the key note of such a clinic's work. What the Chairman of the Advisory Committee of the San Francisco Clinic calls sexual traffic requires such regulation, whatever we may think as to moral and other phases of the question. It is immoral, at that, and inhumane, not to institute sanitary regulations in our large cities. Now the traffic is carried on under conditions that are thoroughly disgraceful. The San Francisco Clinic has been kept out of the reach of politics and gets nothing from the taxpayers. Prohibitive measures against graft are enforced. Semi-weekly physical examinations are made and the fee of fifty cents pays all expenses and gives a slowly growing surplus which it is intended to use toward the purchase of an interim home in the country for the housing of those girls who wish to re-enter the respectable ranks of society. The girls are handled like private patients, are given choice as to physicians, and cared for in hospitals when necessary at the expense of the Clinic, so as to avoid class demonstration. The doctors of the Clinic are not allowed to take any of the clients as private patients, and in fact do not know their names or residences, numbers being assigned. This obviates undue influence and insures equitable handling. Dismissal follows the acceptance of a gratuity on the part of any of the employees. Humane relations are established and without direct missionary efforts many girls are reclaimed. Neophytes are saved, minors are placed under the proper agencies, and white slavers are arraigned and convicted. The initial rate of morbidity of 149 a thousand has been reduced during the last twelve months to a fairly constant rate of 50 a thousand. Two policemen are employed to look up delinquents for examination. The Chairman of the Advisory Committee believes that a preventive sanitary control does not stand in the way of social reforms for the financial betterment of the working girl or of uplifting educational efforts. "A firm but kind and humane watch over the health of these unfortunates, a gentle care when ill, will better prepare a soil for the seeds of intellectual and moral reform than the relics of a barbarous age of witch burning and scarlet letters."

Mental Ritualism.

Probably it has occurred to many thinkers that there are elements of analogy between the practices of certain religious characters and those of medical men; some medical men, let us say. We do many things, we medical men, which sharply differentiate us into High, Low and Broad practitioners. We apply our art with varying degrees of ritualistic observance. Yet highly technical performance may not necessarily be endued with greater virtue as regards beneficent results than methods of simplicity, even in identical instances. Indeed we may say truly that there can be unnecessary ritual, just as there can be a simplicity that approaches or quite reaches dereliction. One is particularly struck by these facts in studying the methods of surgeons and obstetricians. Sometimes, it is true, we mistake painstaking elegance and conscientious detail for "fussiness." Yet it is a fact that very often men who are characterized by the nicest regard for wearisome and not altogether essential detail are really lacking in surgical sense and skill. On the other hand there are the men whose elaborate ritual is conjoined with enormous skill, whom to watch work is an unalloyed delight. Our admiration goes out mostly, however, to the man characterized by grand simplicity, always, it seems to us, the hall mark of the elect.

Carbonated brine baths have no constant effect on the blood-pressure of the human subject.

Medical Editorial Table

NORMAL HEART SIGNS AND THEIR UNNECESSARY TREATMENT.

Clinicians who have had any considerable experience in the treatment of heart disease sooner or later ascertain that, in young people especially, certain abnormal signs resist all measures and that such signs are quite compatible with normal health. Mackenzie, in fact, has reached the conclusion, after a special study of the subject in a large number of young people, that many such people have been and are being subjected to various forms of active treatment for phenomena deemed morbid, which experience has taught him to be signs neither of disease nor of impairment. Candidates for insurance and the Government services are rejected if they show any intermission of the pulse at rare intervals, even though such irregularity is of little or no importance. A mitral murmur, systolic in time, is dubbed "mitral disease with good compensation" if there are no signs of heart failure, although certain functional murmurs, systolic in time, with their position of maximal intensity at the apex, base, or midsternum, not only are consistent with perfect health, but never lead to the slightest sign of heart failure. Functional murmurs and irregularities may, in the young, according to Mackenzie, be manifestations of a perfectly healthy heart, and are of significance only when associated with impairment of the heart muscle. In judging impairment, it must not be forgotten that there is no standard size, shape or position of the heart. There must be marked increase in the rate of the heart, marked loss of power, and marked change in size, before one can say anything very positive. It is well to bear in mind that impairment of the heart muscle of a degree sufficient to endanger life may be present without increase in the size of the organ. As to systolic functional murmurs, they should not be confounded with murmurs due to dilatation, and it is to be borne in mind that we may have marked dilatation with considerable heart failure with no murmurs present. It is a mistake to assume that functional systolic murmurs indicate regurgitation. An important point is to ascertain how the heart responds to effort by studying the effects of exhaustion through subjective symptoms. Finally, pessimistic estimates harm the interests of the patient.—(*New York Medical Journal*, March 13, 1913.)

The Emetic Action of the Digitalis Bodies.

The symptoms of gastric irritability and the related phenomena are commonly charged to a local irritant action supposed to be exerted by the members of the digitalis group directly on the mucous membranes of the stomach and intestines. This view is held almost universally with regard to digitalis and digitoxin, and somewhat less generally concerning strophanthus and amorphous strophanthin. Attention has been diverted from the possibility that the emetic action of moderate amounts of the different substances of the digitalis group might in part at least be of central origin. Hatcher has observed that a smaller dose suffices to induce nausea and vomiting when injected intravenously or subcutaneously than when given by mouth. Indeed, emesis follows the intravenous administration of moderate doses of the digitalis bodies so promptly that not more than the merest traces of the drugs can be excreted into the gastro-intestinal canal before this action is induced. From this point of view it may well be asked whether these drugs do not act directly on a vomiting center. Hatcher and Eggleston have induced evidences of nausea, and vomiting movements, in *eviscerated* animals, by the introduction of the digitalis bodies, proving conclusively that the emetic response can be obtained without the participation of the action of the digestive tube. The doses required to produce such effects are strictly comparable to those used therapeutically. The conclusion is obvious. Important deductions are that the mode of administration and the preparation have only a minor influence on the production of nausea by the digitalis bodies and that instead of seeking for a form of the drug which will not produce nausea we should remove the cause by suspending the administration of the drug, or giving it in smaller doses.—(*J. A. M. A.*, February 1, 1913.)

Ambard's Method of Determining Renal Insufficiency.

Ambard has shown that in the healthy individual there is a constant relationship between the urea content of the blood and the urea content of the urine. In organic and functional derangements of the kidney this relationship is changed, and the extent to which the ration differs from the normal content indicates the degree of renal impairment. The normal ration between the urea of the urine and that of the blood has been calculated to be 0.070. In proportion as the kidneys are impaired this figure is increased. Thus the tendency to a condition of uremia would run parallel with the increase in the urea ratio. The functional capacity of the kidneys is calculated as inversely proportional to the square of this ratio. Thus, in an individual in whom the urea ratio is 0.140, the urea content of the blood is double that of an individual subsisting on an equivalent diet. But in the case of the former the renal capacity is calculated as equal to only one-fourth of the renal capacity of the latter.—(*Medical Record*, Feb. 8, 1913.)

Intratracheal Insufflation in Anesthesia.

Cotton and Boothby regard intratracheal insufflation as the only method that absolutely provides for sufficient aeration of the lungs, regardless of the respiratory movements of the patient. The method employed is that of Meltzer and Auer. Artificial respiration is kept up through the medium of a soft rubber catheter, through which air, under a pressure of about 15 mm. of mercury, is carried directly to the bifurcation of the trachea. It returns from here between the catheter and the tracheal walls to the exterior. The most generally serviceable catheter is a 23 French. The air thus delivered creates currents in the bronchi which greatly facilitate diffusion through the alveoli of the lungs. Meltzer and Auer have demonstrated that efficient aeration can be maintained indefinitely by this method. In two important fields this method met immediate recognition and has stood the test of experience. In accidents attended by stoppage of the respiratory function, such as electrical shock, drowning, etc., the method is satisfactory. The other great field of clinical usefulness for intratracheal insufflation is in the introduction and maintenance of surgical anesthesia in selected cases. Its particular advantages are for intrathoracic work, and for operations on the head, neck and oral cavity.—(*Boston Med. and Surg. J.*, February 6, 1913.)

Association of Clinical Research.

The 1913 meeting of the American Association of Clinical Research will be held at the Sherman House, Chicago, November 7 and 8. The program will be one of unusual interest.

Hospitals and Sanitaria

THE HOSPITAL AND ITS MANAGEMENT.

As the function of the hospital is being the better understood by the laity, it is growing in popular grace. The terror once attendant upon the thought of being compelled to go to an institution as a patient has largely given way to a sense of gratification that the beneficent presence of the "houses of refuge for them that are ill." The medical profession is of necessity giving the hospital, its needs and requirements, the very best of its thought. Medical men are specializing in the work of hospital superintendents and a physician possessing natural executive ability and good judgment is finding an excellent opportunity for his services.

In discussing the qualifications of a superintendent, H. B. Howard, of Boston (*J. A. M. A.*), notices the more or less prevalent notion that executive ability rather than medical knowledge and skill are requisite. He does not think that medical education is wasted and points out many ways in which it is useful and even indispensable to the executive head of a hospital, who must also deputize a large part at least of the actual medical treatment to his subordinates. He recognizes the fact that the medical superintendents of insane hospitals are commonly supposed to be at the head of the medical work and to be expert alienists as well as at the head of the business management, and he says it is rather amusing to see the assurance with which some men try to convince you they occupy such a position.

We who know the facts, he says, recognize the impossibility, and he believes the time will come when the superintendent of the insane hospital will not actually claim that he is the leading psychiatrist in his institution. General hospitals on the other hand have followed the opposite course. They are quite different from what they were a few years ago and their management will tax the energy and ability of the best-trained man. In the first place the hospital should be a first-class hygienic machine and the superintendent should be a first-class sanitarian. Physicians are sometimes poor business men but they must necessarily know more than a layman can of the needs of a hospital. If the staff is to give its best efforts to the treatment of patients it should be relieved from the business details, but it should not have to be overridden in medical matters by a lay superintendent. Medical knowledge is essential in keeping the hygiene of the hospital up to the mark. Every hospital is supposed to exist for its patients and a superintendent who knows most about the medical and surgical work has the clearest view of the needs of the institution and the highest incentive therefore to look out for its efficiency as well as its economy. Hence the necessity of a medical man as superintendent in a general hospital.

Considerable space was devoted to the subject of hospitals in the Association *Journal* of November 9.

W. B. Russ, of San Antonio, Tex., says that with the advances in medicine, there has come a time in which all actually sick persons must be taken to the hospital if they are to receive the care and treatment that the science of medicine is now able to provide. With the perfection of construction and equipment of hospitals there has come into existence a new profession which we have come to call hospital administration, and he reviews the steps which led to this. The hospital administrator must be versed in the principles of the science of medicine "in order that he may coordinate the activities of hospital and its varied facilities with the scientific work of the physicians in charge of the patient." There are not many, he says, of the fully equipped and practically trained men for this position, but their number is growing and the demand for their services is great. If the section on hospitals of the American Medical Association is to achieve anything, he says, its greatest field of usefulness will be in the forwarding of the true relations between the medical practitioner and the hospital administration.

P. E. Truesdale, of Fall River, Mass., noticing the large increase in the number of hospitals in this country says that it is evident that the home can no longer compete with the hospital in the care of the sick. While the prejudice against hospital treatment still exists to some extent on account of the great mortality of cases in these institutions prior to the aseptic era, it is certainly diminishing. The modern hospital now serves to safeguard the household not only from loss of life and spread of disease, but from the financial stress involved in the proper care of the sick. Taking as an instance a case of typhoid fever, he says that without the hospital an attack of ordinary severity would cost the working man not less than $200. Added to this are the difficulties of efficient nursing and the necessary precautions against extension of the disease to other members of the family. Many other diseases also might be mentioned that are communicable and preventable. The home environment is rarely conducive to perfect quietude.

While the hospital affords freedom from home and business cares and anxieties, a well-equipped hospital also furnishes the means for laboratory investigation and refinements in diagnosis and treatment, whereas in the home no more investigation is resorted to than is absolutely necessary. The home will answer as a place for the preparation of simple cases and those requiring only internal treatment, but for others the hospital is best. There is also a growing demand for private hospitals and nearly all general hospitals have found it necessary to add private pavilions to their general plan. This is another fair index to the change of attitude toward hospitals on the part of the public. While there are some model private hospitals, investigations show that the majority are modified apartment-houses operated for profit and lacking the true advantages of a hospital. Some have risen and flourished that in some respects have not compared favorably as regards safety with the home. Truesdale advocates the licensing of all hospitals with a standard that will make them in truth safer than the home for the care of the sick.

W. H. Welch, of Baltimore, believes that from the point of view of the various fields of hospital activity hospital work may be classified as humanitarian, scientific and educational. The care of the sick and injured is primarily humanitarian, but it is not always easy to convince trustees that the others are also essential functions. Welch points out that the furtherance of scientific medicine is also essential to the public welfare. Medicine of to-day is very different from that of former years—it has become more specialized and the hospital will have to become the laboratory of the clinician. And by such use, scientifically directed, is the possibility of solution of the great questions in medicine that are constantly appearing. The use of the hospital for educational purposes is, he says, the great problem of to-day. The theoretical subjects are outstripping the practical ones and the important thing is to bring the clinical subjects up to their level in medical instruction. The most urgent need is to secure teaching hospitals,

and it can only be met through hospitals belonging to the universities. It is for the interest of the patient and the public that such relations should exist.

E. E. Munger, of Spencer, Iowa, advocates the establishment of rural hospitals, holding that the rural population has not the same opportunity for health conservation as have urban residents. While the mortality rate for most diseases is lower in rural districts than in cities, it is possible that cases requiring hospital treatment are sent to the cities and in case of death are reported there. One notable exception is typhoid, the mortality from which is higher than in the cities, and in case of perforation the country physician's patient has scarcely any chance of life. Munger gives statistics of other diseases, such as appendicitis, showing how much less a chance of life the country patient has in this disorder, as well as in some of the complications of maternity. He refers to the recent legislation in Iowa enabling the establishment of country hospitals, not to supplant the standard hospitals, but to give every citizen a chance. He believes there should be developed a public hospital system, fashioned somewhat after the public school system, and that our national health should be looked after by a special department of the government.

F. A. Washburn and L. H. Burlingham, of Boston, discuss the problem om hospital organization, leaving out of consideration the open hospital in which any reputable physician can treat his patients, assuming that no one would claim that such an organization makes for the best care of patients or progress in medicine. The usual type of staff organization is the rotary one, the members of each service taking one shorter or longer term of duty each year. This interests a larger proportion of the profession in the hospital and gives opportunities to a larger number to become proficient. Against these advantages it may be said that the short term of service does not favor continued studies of cases or research, and while many may become proficient, few excel. It does not improve the teaching function of the hospital and appointments on such a staff may be political and otherwise not of the best. Other types of staff organization are that with continuous service, and the mixed type, rotary and continuous.

In the continuous type the heads of departments are supposed to be chosen on account of merit and not necessarily from the local profession. This type of organization favors and gives opportunity for research and patients are under careful and continuous observation. Teaching can perhaps be better carried on and it is argued that it is financially more economical. On the other hand, it does not distribute its benefits as widely in the profession or arouse the same interest in the public, and the scientific attitude of the men in charge does not necessarily insure the best care or greatest happiness of the patients. The authors' search through the literature revealed only two articles in which the rotary system was defended, and none in which the utilization of the hospital for teaching was considered other than beneficial to the hospitals themselves. Two suggestons are mentioned as of interest. One was to eliminate any routine succession in the hospital staff and the other to have a continuous service of five years as juniors and five years as seniors and then retirement from active service.

The plan followed in the Massachusetts General Hospital, an attempt at combining the advantages of both rotary and continuous types of staff organization, is described in detail. The relation of the hospital to the medical school is discussed. The benefits should be mutual, the hospital profiting from having men of eminence on its visiting staff and from the stimulus afforded for careful study and the medical school, of course, from the clinical facilities afforded. The authors think that the hospital should have something to say in making staff appointments and that it might also well bear some of the expense involved in availing it for medical study. As regards training schools for nurses, they believe small and special hospitals cannot expect to attract the best candidates for such work or furnish the necessary material for their education. They should not attempt it but should go to the expense of employing graduate nurses.

In the discussion of civil hospitals one should also consider the military and naval hospitals, which include some of the best institutions in this country. In the above symposium Colonel Charles Richard, of the medical corps of the army, describes the organization, duties and achievements of the army medical corps in times of peace and also that of the organized militia. He points out the inadequacy of the present personnel to meet the complex questions of sanitation, etc., and says that we are justified in the belief that this inadequacy can be best relieved by drawing on the civil hospitals for the medical staff trained in hospital methods. Especially will they be invaluable to the military service in case of war in the general and base hospitals. It was with this object in view that the law establishing the medical reserve corps was enacted. This corps is composed of active and inactive members; the former are assigned to duty with troops and supplement the regular corps; at present there are approximately 125 of these officers in active service. The inactive list of this corps numbers over 900, including former volunteer and contract surgeons of the army and many eminent hospital physicians. In case of emergency when called into active service they would be assigned to the particular duty for which their experience and special qualifications best fit them. Richard believes that the civil hospitals can give valuable aid to the country by stimulating interest in the army as a career for well-trained and capable graduates. The same class of men is also desirable for the medical reserve corps, and we must appeal to the generosity and patriotism of such should the emergency arise calling them to active service. Their training should not be postponed until the emergency comes; they should be afforded the opportunity of gaining the practical experience with troops essential to their efficiency as military medical officers. Here again much can be accomplished by the civil hospitals through concerted action on the part of their staff, looking to the enactment of the legislation necessary to make such opportunity possible. The naval hospitals of the service are minutely described in a comprehensive article in the United States Naval *Medical Bulletin* for November.

The most successful hospitals to-day, says J. B. Murphy, of Chicago, are those that are in sympathy with their staff. The essential for the best results is the rendering to the patient the highest type of scientific service, and for this it is most important to find out about him—to obtain a history—before one makes a move, and this is the hardest thing to obtain. The clinical history is more important in many cases than the physical examination or the laboratory findings—and yet who obtains this history? Often the most incompetent man, the newest intern. It should be the senior one; there has been a greater percentage of wrong diagnosis from imperfect case histories than

from anything else. A longer term of internship than the present one is also a necessity. We must follow the German custom and the one who is to become junior or senior assistant in the departments of medicine and surgery should remain three or four years to round out his apprenticeship. There will be a radical change in hospitals in the near future; the general cleanliness and asepsis of the whole hospital as well as the operating room must be looked after. The next thing will be the administration of the therapy, serotherapy and vaccine treatment, and the best trained men from that point of view will be required. Murphy mentions the failure of his inquiries regarding hospital asepsis as a matter to receive the attention of the Section on Hospitals of the American Medical Association. He also recommends the dividing of the section into committees of investigation of hospitals, the work being definitely mapped out and conscientiously performed. It is the sacred obligation on the part of the section to see that all the work within the hospital is conducted to the very best advantage of the patients admitted.

The following is the hospital organization suggested by H. M. Hurd, of Baltimore: There should be five principal divisions: medicine, surgery, obstetrics, psychiatry and pediatry. The medical department should have the care of diseases of the head, chest and abdomen; of the stomach, bladder, the blood and blood-making organs; and systemic diseases, such as rheumatism, gout, rheumatoid arthritis, parasitic diseases, kidney diseases, intestinal diseases and nervous diseases. To the surgical department he assigns general surgery and the specialties of brain surgery, surgery of the nose and throat, chest surgery, orthopedic and genito-urinary surgery, and gynecology. The obstetric department should comprise the lying-in cases and care of infants and nurslings. The psychiatric department should comprise all mental diseases. The pediatric department should care for all diseases of children, including the eruptive diseases of children—scarlet fever, diphtheria, measles, chicken-pox, etc. Many of these specialties are so important and cover so much useful treatment for teaching that subdivision may be advisable.

In discussing the out-patient work of the hospital, R. C. Cabot, of Boston, says that it is obviously the duty of the up-to-date dispensary, when one patient with infectious disease applies for treatment, to send for the rest of the family exposed and have them examined. One case of rickets is a symptom of more cases in the family; one case of vulvovaginitis means a nest of them in the neighborhood. Out-patient work naturally leads us to the beginnings of things, and in this it is different from ward work, which deals mostly with isolated cases of developed disease. It is just in the incipient stages that phthisis, stomach trouble, malnutrition, lead-poisoning, etc., can be most successfully treated. The community profits far more by bud-nipping treatment in dispensaries than by the palliation of advanced disease in hospital wards. The dispensary hits the problem in three most vital points, while the hospital cannot. It can root out foci of disease, check it in its incipiency and keep the chronic patients from lapsing into discouragement. In spite of all this, we still allow the tradition of superficial slovenly work in dispensaries to go on. The remedies for this are two, he says: more science and more Christianity. Hurry, crowding and lack of assistance should be done away with, and we need the Christian spirit to make our treatment effective.

M. M. Davis, of Boston, believes that the general conditions of efficiency in out-patient service are these: 1. The skill and interest of physicians. 2. The technical equipment for medical and surgical work. 3. The character of the medical organization, the arrangement of services and the general administrative system as a whole. 4. The extent to which the clinics are provided with an organized, paid service, including nurses, social workers and clerks. 5. The extent to which the social problems of patients are dealt with in a definite way. Each of these conditions must be studied separately and, while much attention has been given to the first two and considerable to the third, the fourth and fifth, and particularly the fifth, have been largely neglected. One of the greatest drawbacks to efficiency of an out-patient department is the failure of the patients to return, and to meet this he has had a "follow-up" department. Almost every case of tuberculosis, syphilis and many other diseases is a social as well as a medical problem, and proper conduct of cases in both these regards costs considerable, but Davis thinks it worth while in spite of expense. He has positive testimony from the physicians where it was tried that it was better for them professionally and we may be sure that the patients did not get less benefit. He presents these considerations and the tests described as only a beginning experiment and suggestive of still better methods.

Pneumonia in Open Air Sanatoria.

Harry Lee Barnes, Superintendent of the Rhode Island State Sanatorium, comments upon the common belief among sanatorium physicians that croupous or lobar pneumonia occurs less frequently among tuberculous patients in open air sanatoria than among the general population; also upon the common belief that exposure to cold causes an increase in the incidence of pneumonia. As a result of careful statistical study he offers the following summary:

1. Twenty-nine sanatoria for tuberculosis, from records equivalent to observation on 13,582 patients for one year, reported thirteen cases of croupons or lobar pneumonia with five deaths, or a mortality rate of 36.81 per 100,000 population.

2. The mortality from lobar pneumonia in the United States registration area census of 1910 was 46.37, and if allowance is made for a different age distribution in sanatoria from that of the general population, the death rate for lobar pneumonia in sanatoria should be about 16.97 per 100,000 population.

3. Thirty-eight and four-tenths per cent, of the cases of lobar pneumonia ended fatally, the high mortality probably being due to preceding tuberculous disease.

4. If allowance is made for the high mortality rate of the cases, and for the underrating of lobar pneumonia, in the census, due to "pneumonia undefined" reports, it appears likely that the incidence of lobar pneumonia is about the same in the sanatoria as in the general community.

5. The total death rate from all forms of pneumonia in sanatoria is 213.51+ instead of 32.9 per 100,000 as would be expected, the excessive death rate being largely due to aspiration pneumonia.

6. The impression that lobar pneumonia is rare in sanatoria for tuberculosis is due to the small population under observation, and to the fact that sanatorium patients are at ages which furnish but 36.6 per cent. of the lobar pneumonia cases.—(*New York Medical Journal*, December 14, 1912.)

Blood transfusion is the treatment of choice in severe anemia. The transfused blood is capable of resuscitating from otherwise fatal hemorrhage and physiologically replaces the blood which has been lost.

Surgery

Some Opinions Concerning Tonsil Surgery.

C. C. Stephenson, of Los Angeles, endeavors to enucleate without a break in the capsule. He sometimes fails and either cuts through the capsule or does not quite reach it. This, however, does not happen often. He removes the right tonsil first and then the field of operation for the left is unobscured by bleeding, as the patient lies with the right side of the face downward. The tonsil is seized firmly with a fixation seizing forceps and a Pierce pillar knife used to separate the adhesions, care being taken to avoid cutting the superior constrictor muscle of the pharynx. The cutting is carried all around, freeing the gland from the lower border of the lower lobe up to the supratonsillar fossa. Both pillars are freed and a blunt dissector is carried all around, after which the tonsil is pulled forward enough to draw it well out into the throat, and is then cut off with a right tonsil knife. Hemorrhage is controlled before any effort is made to begin the removal of the left gland. A sponge saturated with Ochner's solution (acetanilid, alcohol and water) is placed between the pillars and firmly held there with the forefinger until all bleeding has stopped. A tonsillectomy is as severe as an appendectomy and should be classed similarly in point of gravity. Stephenson lays down the following principles:

1. All hypertrophied tonsils without lesion or grave complications should be removed.
2. All tuberculous tonsils with lesions should be treated medically and never surgically.
3. All tonsillectomies should be performed under general anesthesia, unless the condition of the patient is such that a general anesthetic would be dangerous.
4. All tonsillectomies should be hospital cases, i. e., the operation should be performed in a hospital.
5. All tonsillectomies should be followed by the passage of an adenoid curette.
6. All curettages following a tonsillectomy should be followed by the passage of the finger.
7. The hot wire écraseur should never be used.—(*California State Journal of Medicine*, November, 1912.)

Overeating as a Cause of Acute Appendicitis.

Emil Novak, of Baltimore, remarks that while recent years have seen great strides in the development and extension of our knowledge concerning the diagnosis and treatment of appendicitis, it cannot be affirmed that the same truth applies to the etiology of the disease. We know very little about this phase of appendicitis, so important from the standpoint of possible prevention. One aspect of the question Novak has cleared up in his own mind—the causation of some cases by certain factors referable to the digestive canal, and especially overeating. After a review of prevailing opinions as to the etiology and a thorough presentation of anatomical, clinical and other facts bearing upon causation from the author's point of view, the following conclusions are offered: 1. A considerable number of cases of appendicitis are caused by overeating. 2. As a result of overdistention of the stomach, the superior mesenteric vessels, lying immediately behind this viscus, may be subjected to compression. 3. If such compression occurs, there is produced a decided interference with the intestinal circulation. 4. The first effect of such a circulatory disturbance is the excitation of more or less violent peristaltic activity in the intestine, thus explaining the pain usually felt in the epigastrium at the onset of an attack of appendicitis. 5. Another effect, direct or indirect, of this disturbance of circulation is exerted upon the appendix, the resistance of which is diminished to such an extent that it often falls a prey to the action of the ever present *Bacillus coli communis* and other intestinal organisms. A more or less severe attack of appendicular inflammation is thus precipitated. 6. The moral is plain enough: Don't overeat!—(*New York Medical Journal*, Dec. 14, 1912.)

Local Anesthesia in Operations on the Rectum.

Charles B. Kelsey, of New York, calls attention to the rather wide range of operative rectal work that can be undertaken in the office under local anesthesia. Kelsey prefers weak solutions of eucaine. Whatever surgery of the rectum is done under eucaine must be done without any very decided stretching of the sphincter. This is a limitation, as the work must be done on the skin, as in fissure or fistula, or through a speculum, as in hemorrhoids or polypi which cannot be extruded by straining. Kelsey regards it as useless and dangerous to try to overcome sensitiveness of the whole anus by injecting an anesthetic subcutaneously to an extent which will permit of stretching the muscle. Simple fistula may be operated upon successfully under local anesthesia. Where this is not the case and the sinus is tortuous and bifurcated the attempt to cure in this way will generally be a failure. Cut simply through the muscular fibers forming the base of the ulcer, not deeply into the cellular tissue. This seldom fails to cure. Neglect to remove prolapsing hemorrhoids at the same time, if present, accounts for many failures. Kelsey prefers the clamp and cautery method of treating hemorrhoids, which necessitates the use of general anesthesia, except in cases where the hemorrhoids can be pulled down into reach without dilatation of the sphincter. Here the ligature may be used, one hemorrhoid being removed at each sitting. To remove several in this way is not good practice. The galvanocautery treatment is easily applicable to the cases in which the tumor or tumors can be easily extruded by the patient or brought outside by a speculum. The tumor outside, inject fifteen or twenty drops of a weak solution of eucaine until the tumor is distended and whitish, when the application of the galvanocautery will be painless. If these changes do not follow upon injection the operation may give some pain, though this will not be severe. After allowing time for the eucaine to take effect, pass a small and delicate galvanocautery wire, heated red, into the center of the tumor. If heated white and quickly withdrawn hemorrhage may be expected to occur. A red needle left in for a moment and gradually withdrawn will cauterize sufficiently to close any vessel which it may have opened. There is seldom any after pain and Kelsey has had no accidents or complications. Other tumors may be removed after two or three day intervals. After three or four such applications soreness may develop and it will then be necessary to intermit further treatment for a week. This method of treatment is safer than the injection treatment. Kelsey does not claim that it is better than the clamp and cautery operation, which is a favorite one with him, but merely that in many cases it does away with the necessity of general anesthesia.—(*Medical Record*, December 14, 1912.)

Birch Hirschfield is quoted as believing that affections of the optic nerve frequently arise from ethmoiditis and "lead early to optic neuritis."

Anesthesia.

W. P. Burdick (*Therapeutic Gazette*, June, 1912), writes on the preliminary use of morphine and atropine. They are found to allay fear at the beginning of anesthesia, almost entirely eliminate the stage of excitement, lessen excessive secretion of mucus and diminish the tendency to nausea. These are some of the advantages claimed by their advocates for their use. Objections urged against them are as follows: Morphine is dangerous because it diminishes or abolishes all reflex irritability. It increases, in many, post-operative vomiting. It masks symptoms during operation. By producing pulmonary congestion it increases the tendency to lung complications. It prevents the patient coughing up mucus collected in the throat during operation, and should vomiting occur proper efforts cannot be provoked to eject the vomitus, which falls back into the trachea. Intestinal paresis is increased by morphine. Atropine checks the nasal, buccal, pharyngeal and bronchial secretion, thus rendering sensitive surfaces subject to the irritation of the anesthetic. The reactionary secretion that follows is a tough and tenacious mucus that increases the tendency to pneumonia. By checking sweating a strain is thrown upon the kidneys at a time when they are least able to stand it. The increased surface temperature evidenced by surface congestion produces reduction of internal body temperature through radiation, thus lowering vital activity and demanding greater strain upon the heat center. The hemostasis induced by atropine during operation is deceptive and is followed by reactionary oozing. The tenacious mucus formed in the throat after atropine causes faucial irritation, productive of vomiting as well as annoying hawking and cough. It is even doubtful if it stimulates respiration or lessens the tendency of morphine to cause vomiting.

A Method of Continuous Dilatation of Extensive Urethral Stricture.

Joseph Rilus Eastman, of Indianapolis, offers an improved method of draining the bladder after perineal section for strictures that narrow both the anterior and posterior divisions of the urethral canal (*J. A. M. A.*, December 7, 1912). Instead of leaving a large soft rubber catheter in the urethra, extending from the bladder to the external meatus, with its tendency to cause abscess formation or extensive inflammatory reaction through pressure at the penoscrotal angle, Eastman provides for continuous dilatation of the entire canal without angulation by placing two catheters in the following manner: One is used as a perineal drain, passing from the bladder out of the perineal wound, while the other is passed from the meatus down to the perineal catheter and secured to it by means of a chromic catgut loop at the opening in the membranous urethra, the nose of the catheter in the pars anterior thus resting against the perineal catheter. In this way the normal urethral caliber is permanently re-established in two or three weeks, though sometimes it may take longer. Catheters of 26 French are large enough, because after such an instrument has exerted its influence for two or three weeks the urethral caliber will be found to be several sizes larger than that of the catheter. The urethra should be irrigated before introduction of the catheters, and subsequently irrigation should be practised, if practicable, between the catheter and the urethral mucosa. A discharge will occur, but tolerance is developed in a few days. Opiates and quinin may have to be used in refractory cases. Eastman has kept the catheters in for two months without changing in two cases. Hot, weak potassium permanganate solution may be used for injection between the catheter and the mucosa. After removal of the catheters the mechanical urethritis clears up rapidly. The catheters employed have two eyes. Large sized catheters which completely fill the lumen of the urethra occasion less frictional irritation than smaller ones, which readily bend sharply, or angulate, or slide and twist in the canal. The presence of the large catheter in the bladder neck relieves irritability in this region. Severe muscle spasm or tenesmus rarely occurs during its use. In order that during erection the outer end of the short catheter may not be drawn in through the meatus, it is secured by a safety-pin with a gauze ring to serve as a buffer. While it is true that a small soft thin-walled rubber catheter, used to drain the bladder in the usual manner, has less tendency to cause abscess than a large rubber tube with thicker walls, nevertheless the former is of less value as a dilator and is more difficult to retain in position. It is also true that if the outer end of the catheter as ordinarily employed be drawn up over the abdomen and connected with a urinal at the side of the bed, one curve is made of the urethral canal, and the danger of abscess lessened. It is not easy, however, thus to hold a catheter in place because of unavoidable traction. The method described appears to meet all requirements perfectly.

Medicine

LIBERAL FEEDING IN TYPHOID FEVER.

Bernard Kohn, of Philadelphia (*Pennsylvania Medical Journal*, September, 1912), advocates a more liberal diet in typhoid fever in order that excessive emaciation may be prevented. A strict liquid diet for six to twelve weeks may cause a loss of from forty to fifty pounds. Such losses can be prevented by a diet of sufficiently high caloric value. They are not the result of pyrexia and toxemia to the degree formerly supposed. Shaffer and Coleman have succeeded not only in preventing any material loss in weight, but even occasionally in producing a gain. Patients liberally fed are brighter than those on strict liquid diet, less inclined to stupor and delirium, lack the stale, heavy odor of profoundly toxic patients, and possess far more energy and resistance to complications than do their less forunate brethren. A normal, resting man requires 33 food calories for every kilo of body weight. The average typhoic patient requires 25% more, to meet the febrile increase in heat production, *i. e.*, 41 calories per kilo, or about 3000 calories for a 150-pound man. The average daily ration of two quarts of milk for a typhoid patient is equivalent to 1400 calories, or less than 50% of the required amount. The hunger and craving for other food is probably Nature's protest against starvation. Why not heed her protest? Nichols has shown that 1000 cases on mixed and liberal feeding gave the low mortality of 7.7%, while the proportion of complications was not at all increased. Kinnicutt has shown that perforation and hemorrhage are rather less frequent under a mixed, soft and solid diet than under a restricted diet consisting mainly of milk. In fact none of the reported observations on liberal diet have so far noted any increase in the frequency of hemorrhage and perforation. It is a common experience to find more abdominal distention with milk diet than with liberal feeding. As a matter of fact, ingested milk coagulates in the stomach almost immediately, and then becomes a solid food, whereas well-cooked cereals, soft-boiled eggs, crackers, toast and similar articles become reduced to a semi-

liquid condition long before they reach the ileum. Experiments of von Hösslin, von Leyden, Klemperer, Puritz, Folin and others have shown that there is comparatively little diminution in the digestive and absorptive powers of the average typhoid patient. And no one advocates the inclusion of the more indigestible articles of food in the typhoid dietary. These patients should be fed every three hours until the appetite is satisfied. If they will not take much food, use sufficient milk sugar in what they do take to keep up the caloric value. Well-cooked starches, which means five to six hours' cooking, are readily digested, that is to say rice, tapioca, farina, oatmeal and similar cereals. Coleman and Shaffer have had remarkable results with a daily ration of one and a half quarts of milk, one to two pints of cream, one-half to one and two-thirds pounds of milk sugar, and three to six eggs. Kohn himself gives a daily ration of 32 to 48 ounces of buttermilk; two eggs—raw, in custard, soft-boiled or poached; cereals twice daily, with cream and sugar; baked potato; scraped beef, salted, once daily; crackers and butter, twice daily. His mortality has been three per cent. Hemorrhage in 8.8% of the cases; none fatal. No perforations. Convalescence is shortened, the patient is more contented and less prostrated, and he is able to return to his occupation much earlier than under the old forms of starvation or semi-starvation treatment.

A New Means for Antipyresis.

Schuster of the Department of Internal Medicine, of the Chemnitz City Hospital, believing that antipyrin produced some action which was unnecessary, sought for derivatives of antipyrin which were free from those characteristics. Up to the present time he had been using pyramidon which was in good repute on account of its continued action in small doses, as well as the insignificant gastric disturbances which followed its administration.

He decided, upon reading the work of Leoning in acute and subacute polyarthritis, to make use of the latest derivative of antipyrin, known as melubrin, and his experiences confirm the statements of Leoning that this drug is a specific in polyarthritis. He gave thorough doses of from 3 to 8 grams according to the age and constitution of the patient and found this heavy dosage was always well tolerated. He also found that he never failed to receive excellent antipyresis and that after the use of the drug the pains in the joints ceased and the joint swellings were greatly reduced. These arthritic effects took place either with or directly after the reduction of the fever. Relapses occurred occasionally, but only after discontinuing the treatment before a complete cure had been effected. Relapses disappeared more rapidly in the case of these patients than like attacks in the same people when other remedial agents had been used.

Schuster found that a great therapeutic field was opened to treatment by melubrin in a variety of febrile diseases. He noted that the antipyretic action of the drug was especially good in typhoid fever, pneumonia, erysipelas and influenza. In all acute and subacute rheumatic conditions, as well as in a number of joint affections with different etiological bases, melubrin gave splendid service, and he was satisfied with the results in sciatica.

Schuster also made use of melubrin as an antispasmodic in the treatment of children's diseases. To several children, whose ages ranged from six months to four years, he gave melubrin in the proper doses and found that it was easily taken and well tolerated. Complicated pneumonias did not develop.

His experience with the drug upon a great many patients brought him to the conclusion that it had no influence on blood pressure and that it can be used in various cases with which there is a cardiac complication. In most of his patients no disturbance of the organic functions occurred. During these investigations Schuster used 3,000 grams without any untoward results.—(*Deutsche medizinische Wochenschrift*. No. 7, February 13, 1913.)

The Signs of Overdosage in Digitalis Administration.

W. A. Bastedo, of New York, prefaces his paper with the remark that digitalis poisoning is almost invariably the result of overdosage in its administration for therapeutic purposes. Some of the symptoms formerly attributed to the disease of the heart we now know are really manifestations of the toxic action of the digitalis given as a remedy. As a rule the undesirable effects are obviously due to the drug. Sometimes there is uncertainty, until we note the disappearance of the manifestation shortly after the digitalis is stopped, and its reappearance under further administration of the drug. But it must be remembered that the toxic effect may be quite persistent, the drug action continuing in some cases for as much as three weeks after a single intravenous dose. Bastedo has observed persistence of partial heart block for three and one-half weeks after the stoppage of digitalis, and of complete block for one week. Cushny has reported a case of auricular fibrillation in which through the influence of digitalis "inhibition had gained a permanent control over the heart," so that the effect persisted indefinitely after the drug was stopped, or was perpetuated by an occasional dose. Bastedo thinks from his experience that such an effect in auricular fibrillation is not uncommon. Bastedo's paper is a very thorough one which should be read by all who are interested in heart work, which means practically everyone. He concludes his article with the dictum that the margin of safety with digitalis is fortunately a large one, so that there is no undue danger in the use of even large doses by mouth or hypodermatically if the administration is stopped when one of the following conditions arises, viz.:

1. *Nausea is marked.*
2. *The radial pulse goes below* 60. The pulse may become progressively slower for a few days after the drug is stopped, hence the necessity for ceasing its administration before the slowing has become extreme.
3. *A rapid ventricle* with rate unaffected by digitalis for several days suddenly becomes slower (heart block).
4. *A regular ventricular rhythm changes to irregular,* as from premature beats or the development of auricular fibrillation; or *becomes intermittent,* as from partial heart block.
5. *Paroxysmal tachycardia occurs.*
6. *The absolutely irregular rhythm* of auricular fibrillation *becomes slow and regular* (complete heart block), or *shows coupled rhythm or phasic arrhythmia.*

Finally, Bastedo says that considerable risk may be avoided by restraining from the use of digitalis (*a*) when the veritricle is intermitting, (*b*) when there are premature beats, or (*c*) when there is bradycardia.—(*The American Practitioner*, December, 1912.)

We have now in the Wassermann test a method of diagnosis, whose positive results are very reliable when the test is performed by a properly qualified man. Nonluetic conditions giving a positive test would seldom confuse, and especially seldom in pregnancy.

Genito-Urinary Diseases

Gonococcus Vaccination as a Guide in Diagnosis and Treatment.

Julius London, of New York (*American Journal of Surgery*, November, 1912), discusses the advantages of possessing, in obscure cases, a means of diagnosing gonorrhea not dependent upon the discovery of the gonococcus itself. This is especially true of joint, tendon, endocardial, peritoneal and pleural infection. It takes from four to six negative findings, at intervals of seven to ten days, to be safe to say that the prostatic and vesicular secretion no longer harbor gonococci. London's method of securing a local reaction has the advantage over this procedure of simplicity and of furnishing a visible opsonic index in vaccine treatment. Cured cases give negative reactions. This is important for young people who desire to marry and want to know their condition. Bruck has also suggested the possibility of preventive vaccination against developing gonorrhea. The objection to this, however, is the fact that healed cases of gonorrhea give negative reactions, which means that the body does not stay sensitized very long after the active focus is healed, but the idea may be turned to advantage by vaccinating against the complications of gonorrhea simultaneously with the local treatment. London injects the gonococci, suspended in normal saline solution, into the endodermal layer of the skin with a hypodermatic syringe and fine needle. The method corresponds to the Hamberger "stich" reaction method in tuberculin diagnosis. Normal saline solution may be used as a control injection. The skin on the inner surface of the arm or forearm is cleansed with alcohol or ether and two or three minims of a saline suspension of from 50,000,000 to 100,000,000 dead gonococci per Cc. thrown into the skin. Enough of the suspension should be employed to put the skin under slight tension, which is shown by the formation of a slight wheal; this shows that the injection is not subcutaneous, as then no wheal would appear. A positive reaction occurs in about twenty-four hours—a central papule, red, surrounded by a lighter red areola, two or three inches in diameter. The reaction fades in one or two days, but the papule sometimes lasts seven to ten days. Recent infections give the most marked reactions. The earliest reactions obtained were in one case two days and in another three days after urethritis began. As to the employment of the method as a visible opsonic index in vaccine treatment, London points out that in some chronic infections, notably chronic pneumococcus endocarditis and chronic erysipelas, the white blood cells at times lose their phagocytic powers in the presence of the patient's own serum. Rosenow has shown that good phagocytic powers do not mean a corresponding destruction of germs, and that small doses of pneumococci act more favorably in septic pneumococcus endocarditis than large ones. This suggests to London the possibility of using endo-dermal vaccination with a pneumococcus suspension to see the amount of reaction the body is making to therapeutic vaccination.

Phthalein Test for Kidney Function.

Frank S. Crockett, of La Fayette, Ind., says (*Jour. Ind. Med. Assn.*, October, 1912) that it was Virchow who probably first called attention to the fact that the pathologic state of the kidney was relatively less important than the ability of the kidney to functionate. A badly diseased kidney may perform the work assigned it far better than one that seemed apparently healthy. Of course these facts are not in keeping with earlier conceptions of kidney pathology. Since the volume of albumin is no index to the sufficiency of the kidneys we have sought for tests that would determine this poitn. Gyroscopy and electrical conductivity tests have been found too complicated and there are objections as well to the phloridzin test, whereby the induction of artificial glycosuria is made to form a basis for clinical judgment. Dyes like methylene blue, indigocarmine and rosanilin do not meet all the ideals, but in Remsen's phenolsulphonephthalein Geraghty and Rowntree have found a substance which meets all the requirements of the ideal function test. It is non-irritating in application, it can be used in small dosage, it has no action whatever on the system, it appears quickly in the urine, it is not excreted by any other organ, it is not changed chemically in the body, and the rate of elimination is not influenced by the quantity of urine excreted. It is practically all eliminated in health within two hours when administered intramuscularly or one hour when given intravenously. In health it appears in the urine in from five to eleven minutes; the first hour's elimination averages 50 per cent.; the total for two hours varies from 60 to 85 per cent., only a trace being found after the two-hour period. The kidneys excrete the dye in the same percentage whether the urine is scanty or free. Diuretics have no effect on the rate of excretion. Varying degrees of blood-pressure and different grades of anemia do not influence the excretion. This test will accurately foretell uremic conditions, even in the absence of clinical, chemical or microscopic symptoms. In mild cases the output of the dye approximates the normal, but in long standing or more severe cases the output is markedly decreased. In very severe cases, or in cases of long standing involving marked tissue changes and destruction, a mere trace may be found, when the prognosis becomes very grave. In fact, the failure of excretion is always followed in a short time by death. The test reveals the degree of destruction of the renal substance. Geraghty and Rowntree have encountered cases in which the urinary output, the urea, the total solids and the total nitrogen were normal and casts were absent, yet in which the total failure of phthalein elimination was followed shortly by deep coma and death with symptoms of marked uremia, the autopsies showing atrophy of the kidneys, together with a severe grade of interstitial nephritis. The test appears to be of equal value in both parenchymatous and interstitial types. No parallelism appears to exist between the urea percentage and the phthalein output. Urea is not a correct indicator of the renal function.

The Treatment of Syphilis.

An editorial in *The Therapeutic Gazette*, December 15, 1912, elaborating on the necessity of proper treatment in syphilis, says:

"Neosalvarsan in 5-per-cent. solution can be injected intramuscularly with less pain and reaction than can salvarsan. This in regard to the pain is particularly true if a solution of novocain is driven into the seat of injection before the arsenical drug is employed. This intramuscular injection, however, is to be used only under certain exceptional circumstances.

"The question naturally arises in the minds of practitioners as to whether Ehrlich's arsenical preparations have so firmly established their therapeutic efficiency as to require their routine use in the ordinary cases of syphilitic infection.

"An affirmative answer can be given to this query. and one with very few qualifications. These arsenical

preparations have shown themselves singularly devoid of danger, providing they are given in proper dosage and to cases neither exhibiting the cachexia of profound visceral degeneration nor signs of extensive cerebrospinal involvement. The hope of entirely overcoming a syphilitic infection by a single large dose of the drug is apparently fallacious. The fact that many cases are promptly and radically cured by a course of treatment followed by mercury is shown by the number of syphilitic reinfections which are now recorded in medical journals, this reinfection necessarily implying that the original disease must have been cured. Among the precautions to be observed in administering salvarsan and neosalvarsan, the latter representing distinctly the drug of choice, are due attention to the purity of the water used as a solvent and the promptness with which injection is made following solution. Moreover, it seems unwise to give these injections to patients suffering at the same time from infections other than syphilis—grippe, for instance. In view of the fact that occasionally anaphylactoid phenomena develop, or those of arsenic intoxication as an expression of idiosyncrasy, the patients to whom these injections are given should be kept either under observation or within reach after each treatment. The large majority of patients to whom neosalvarsan is given experience no ill effects and feel prepared to go on with their usual routine of life. This, however, cannot always be counted upon.

"Syphilitic infection seems curable by salvarsan in direct proportion to the timeliness with which the drug treatment is given. The diagnosis of chancre can be made by the finding of the spirochætæ. As soon as the examination is made the treatment should begin, preferably by an immediate andwide excision of the chancre, if this can be accomplished without resultant permanent deformity. Whether this excision be practiced or not the neosalvarsan injection should be made at once. The initial dose of 0.6 salvarsan or 0.9 neosalvarsan, repeated by 0.9 or 1.2, repeated again in three days with this larger dose, and followed by a month of mercurial treatment and one more dose of the arsenical preparation, is regarded as the most approved method of aborting the disease. Both in the case of the arsenic and the mercury the dosage should be such as to produce at most a transitory deterioration of the patient's health. He should feel as well if not better than before the beginning of his treatment, should relish his food, and be fit for his work. The toxic effects of either drug by lessening vital resistance lessen the chances of either a symptomatic or radical cure. The subsequent course of the disease may be known by the Wassermann reaction.

"During the tertiary period of syphilis, if the symptoms of cerebrospinal involvement are present, as evidenced by headache, alterations of temperament, irritability, backache, etc., the salvarsan should be preceded by mercury, the arsenic preparation being followed at times in these cases by changes so intense as to resemble a hemorrhagic encephalitis. Ehrlich has pointed out that there is a distinct and most valuable emergency treatment in cases exhibiting anaphylactoid symptoms following injection. Lumbar puncture should be practiced, followed by enteroclysis or even venoclysis, and further by the administration of calcined magnesia and hypodermics of caffeine. For those cases of coma incident to acute yellow atrophy of the liver with profound renal degeneration there seems to be no special form of treatment, death necessarily resulting."

Kidney Resection.

J. H. Cunningham, Boston (*J. A. M. A.*, January 4), gives an experimental investigation on rabbits to ascertain the influence of operative measures on the function of the kidney. The suggestion for the study was given by the temporary anuria observed in a woman with single kidney who had been operated on for renal calculus. It was necessary to extirpate one kidney in the rabbits, taking the measurements of the other so as to later determine its compensatory enlargements and noting the time in which the rabbit's remaining kidney voided urine. The remaining kidney was subsequently operated on, first after measuring, and a small portion of the kidney substance, from its greater convexity to the pelvis, was resected. The wound was closed in a certain number of rabbits with mattress sutures and the time passed before voiding urine noted. Drainage was established in a certain number of rabbits with a rubber tube and in others with gauze, the kidney wound being not entirely closed and the time noted when the kidney secretion was again established.

It became evident from these experiments that the operation of kidney resection on a healthy rabbit with only one kidney, though that is healthy and has undergone its maximum vicarious enlargement, does temporarily diminish the function of the organ, as shown by the fact that urine secretion ceases for many hours. In the rabbits in which drainage was used and the wound not closed the secretion was re-established much earlier. The escape of fluid was rather freer with rubber-tube drainage than with gauze. Cunningham does not offer explanation of the facts. In splitting the kidney the blood tension must be disturbed and it would seem that the tension should be greater when the wound was closed than when it was drained. Accepting the idea that kidney secretion depends on its blood tension as correct, there should have been a freer secretion when closed by suture than when drained, which is not in accordance with the results in these experiments. The possibility that the nervous system controls the secretory process and that this was more disturbed in the closed wound cases is suggested. Further investigations are promised on the kidney secretion in changes in blood-pressure and if possible with the elimination of the nerve influence.

Why Not Mention the Journal?

The new editor of the *Journal* of the Michigan State Medical Society, Dr. F. C. Warnshuis, editorially advises his readers as follows in the March issue:

"The Editor has secured new advertising contracts to the amount of $425. This sum equals one-third of the entire advertising receipts for 1912, and is new business in addition to the contracts that are in force. This new business has a life of from three months to a year and it rests with the members to decide whether or not contracts will be renewed when they expire. I do not intend to commercialize our JOURNAL and reduce it to the plane of "Trade Journals." We do, however, need advertisements in order that we may be enabled to issue a first-class journal. We will not have advertisements if the business man finds that our advertising columns do not pay a fair return on the money they invest in them. There is one "ad." that has been inserted in this issue that is an experiment. If this advertiser receives a fair number of replies in response to this "ad.," he has assured us a year's contract. In view of this, I desire to urge on our members to patronize our advertisers and tell them why you are doing so. Make it a point to read the advertising pages of every issue."

If every physician, who asks a pharmaceutical house for a sample, or seeks information along any line, would mention the medical publication in which he saw the advertisement or reference, it would serve the double purpose of assisting both the journal and advertiser and such action would not detract from the physician's dignity.

The Physician's Library

Keen's Surgery, Volume VI: The Volume with the newest surgery. By 81 eminent surgeons. Edited by W. W. Keen, M.D., LL.D., Emeritus Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College. 1177 pages, with 519 illustrations, 22 in colors. Entire work, consisting of six volumes, per volume: Cloth, $7.00 net; Half Morocco, $8.00 net. Philadelphia and London: W. B. Saunders Company, 1913.

It is doubtful if in the compass of 70 chapters any branch of medicine was ever so thoroughly and authoritatively discussed, as surgery is covered in this concluding volume of Keen's admirable series. Most of the contributors possess reputations of deservedly international character and those men whose work is only known in their own sections have added their share to this brilliant resume of surgical practice. A galaxy which includes the Mayos, Murphy, Crile, Finney, Fordyce, Martin, Thomas and Ochsner of the United States, Adami of Canada, Bland-Sutton, Mayo-Robson and Moynihan of England and Gottstein and Kümmell of Germany, may well be expected to reflect the very latest and best in surgery.

It would be impossible, in the restricted space of a book review, to take up in detail the prominent features of this book. Its purpose is to give the readers of the five preceding volumes the last word of the surgical world. Therefore it must suffice to mention some of the additions to that which has gone before.

Of course, Crile's anoci-association, so well described by its originator at the last Clinical Congress of Surgeons in New York, is thoroughly covered, as are the different methods of anesthesia, such as intratracheal insufflation, the use of nitrous oxid and the intravenous injection of ether. The anatomy, physiology, pathology and symptomatology of the pituitary gland is discussed and the treatment of the medical and surgical hypophysical diseases considered. The use of the electric desiccation and fulguration in the treatment of cancer is described at length. Martin of the University of Pennsylvania, goes into the cure of syphilis with salvarsan, and the various operations on the thoracic cavity under positive and negative pressure are fully exemplified. In short every new surgical feature has been ably and sufficiently covered.

The bringing together of this wealth of chirurgical material is one of Dr. Keen's many master strokes and the series of six volumes on the branch of medicine in which he is leader will stand as his enduring monument.

Anatomy and Physiology. By Elizabeth R. Bundy, M. D., of the Philadelphia Women's Hospital. 2d edition. Cloth. 335 pages and 215 illustrations. Philadelphia: P. Blakiston's Son & Co., 1913. This book is intended for nurses.

It is difficult to combine more than an elementary knowledge of both these great subjects in so small a compass, but on the whole the author has done it well. Some of the physiology is not entirely up to date. For example, on p. 131 is the statement that "the ferment of the glands of Lieberkuhn is not known," despite the fact that modern physiologists give erepsin as the enzyme of the glands. On the whole, however, the book is an excellent presentation of anatomy and physiology for nurses and will give then as definite information along the lines laid down as is necessary for their work.

Prisms, Their Use and Equivalents. Incorporating the Author's Double Prism—a new and delicate test for the detection of errors of muscular imbalance. By James Thorington, A. M., M. D., Professor of Diseases of the Eye in the Philadelphia Polyclinic; Ophthalmic Surgeon, Presbyterian Hospital, etc. Cloth. 144 pages, profusely illustrated. Price $2.00 net. Philadelphia: P. Blakiston's Son & Co., 1913.

Thorington is well known by his previous books, Retinoscopy, Refraction and How to Refract, and the Ophthalmoscope. The present work is intended for oculists, who desire a wider knowledge of refraction. It is a careful presentation of the subject of prisms and gives a vast amount of knowledge concerning these valued refracting mediums. The illustrations are very instructive and the colored plates are exceptionally helpful in showing the various kinds of prisms.

Human Physiology. By Prof. L. Luciani of the Royal University of Rome. Translated by F. A. Welby. Vol. II. Cloth. 558 pages. Price $5.25 net. New York: The Macmillan Company, 1913.

This volume is devoted to Internal Secretions, Digestion, Excretion and the Skin, and it is one of the clearest expositions of the important bodily functions ever presented. The author deals with his subject minutely, but with a lack of technical verbiage which is so apparent in some physiological text books. He goes into the latest theories in the subject and handles each sub-division in a concise, snappy way which readily fixes and holds the attention of the reader. An interesting and useful feature is the quotation of over 1,000 writers on physiological subjects. Vol. II is quite in keeping with its predecessor and we shall await the two succeeding volumes with pleasant anticipation.

The Practice of Urology. A Surgical Treatise on Genitourinary Diseases, including Syphilis. By Charles H. Chetwood, M. D., LL. D., Professor of Genitourinary Surgery, New York Polyclinic; Visiting Genitourinary Surgeon to Bellevue Hospital, etc. 824 pages, large octavo. Profusely illustrated. Muslin, $5.00 net; half-morocco, $6.00 net. New York: Wm. Wood & Co., 1913.

The author has given the profession a distinctive and valuable work in this volume. Several points commend it: 1. It is practical, not theoretical. 2. It recognizes urology as surgical, instead of hybrid, in that it does not combine gynecology and practice with urology. 3. A logical handling of the subject under discussion, as e. g. causation, diagnosis, prognosis, treatment, with every abnormality that may occur. 4. The recognition of syphilis as part of the field of the urologist. 5. A list of instruments is given for every operation. 6. It is not too voluminous to be of general use and is not too brief too lose its value as a book of reference.

No book has covered the subject more completely

(*Continued on p.* 20.)